

# The Iron Age

A Review of the Hardware, Iron and Metal Trades.

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## Geer's Double and Single Action Spring Butts.

The increased demand for double spring butts or hinges for opening and shutting doors has resulted in the introduction of a large number of new varieties within a short time. The aim of all these seems to be to produce a butt or hinge that will force the door to remain in perfect line when closed, and at the same time to offer the least resistance when the door is open.

The new hinge lately introduced by the Cowles Hardware Co., Unionville, Conn., not only possesses these, but some other advantages in addition, among which may be mentioned these facts, viz., that their greatest power is exerted when the door is closed, keeping a pair in exact line without the adjustment of the springs, and that the door when swung open beyond a right angle will remain in that position without fastening the spring, retaining the door in position as soon as it is opened beyond a right angle. This is a valuable improvement in many places, as, for instance, in case of a crowd coming out of a church, theater or other public building, the door being opened is held back firmly in position against the wall.

The illustrations herewith show these hinges both double and single action. From these it will be seen that the hinges are suited for either right or left hand doors, a point which will be appreciated by the consumer.

## The Niles Sugar Mill.

We illustrate upon this page the Niles sugar mill, well known throughout the Southern portions of the country. The aim of the constructors was to proportion the mill so as to obtain the greatest strength with the least metal. The manufacturers, Messrs. R. H. Allen & Co., 189 to 191 Water street, N. Y., by using only the best of charcoal iron, either wrought or cast, carry out the original design and make it unnecessary to add iron simply for the purpose of making a mass of poor metal do the work of a much smaller amount of the best. The following table will give some idea of sizes, capacity, weight, &c.

No.	Size of rolls, Inch.	Weight of mill, Tons.	Capacity per day, Arobas.	Eng. H. P.
No. 3.	16x16	3 1/2 to 4	80 to 120	10
No. 4.	20x16	9 to 10	160 to 200	16
No. 5.	24x16	18 to 19	240 to 320	25
No. 6.	28x16	22 to 23	320 to 480	30
No. 7.	32x16	23 to 25	360 to 520	36
No. 8.	36x16	28 to 30	400 to 560	50
No. 9.	40x16	31 to 33	450 to 600	60
No. 10.	44x16	37 to 39	520 to 680	60
No. 11.	48x16	40 to 42	560 to 720	75
No. 12.	52x16	41 to 43	640 to 800	75
No. 13.	56x16	45 to 47	720 to 960	100

The general tendency among the manufacturers of sugar mills has been to increase the surface speed in order to obtain as large a product as possible from a small mill. This is done at the expense of a diminished yield of juice from a given quantity of cane. Extensive experiments made in the island of Cuba some years since, demonstrated the fact that there was a gain of 22 and a fraction per cent. in reducing the speed from 24 to 16 feet per minute, the latter speed giving the maximum result. In the "Niles mill" the speed is 18 feet per minute, being very nearly that which experiment points out as the best. Taking into account the cost of machinery, power &c., this speed gives the best results obtainable in general use, coming as it does so very near to the theoretical figure.

## Prison Labor.

The Boston Commercial Bulletin says: There are two sides to the question of the employment of convict labor in competition with that of honest men and women. The first thing that impresses one at the first glance is the fact that, as a rule, prison labor is paid from one-half to three-fourths less than free labor, and the question immediately pressed upon the attention by this fact is, How can the honest man live in such a competition?

The following statement shows the work done and prices paid in the more prominent county prisons of Massachusetts: At Pittsfield, ladies' boots and shoes and slippers are made, the county receiving \$12 a quarter for those sent to the shops. At New Bedford, basket, and boot and shoe making are carried on for the county, but the orders have been light, and less than half the prisoners have been supplied with work. At Ipswich the shoemakers receive 15 cents per day, and unskilled laborers 10 cents, the latter working at making "pancake" (from the parings and scraps of hides and leather) used for

inner soles and heels. At Lawrence the men work at making slippers at \$5 per case of 60 pairs; closing boots at 88 cents, and closing and fitting at \$1.10 per case of 12 pairs. At Springfield the men are kept at work upon carpet slippers, the contractors paying 5 cents a day for labor. At Northampton a new contract has just been made for the labor of the prisoners at 6 cents a day, the work being the manufacture of harnesses, halters, &c. At Cambridge the prisoners are employed at brush making for the county. At Dedham, chair-seating is done at 4 cents each for common chairs. At South Boston a small portion of the men work on slippers

the command to involuntary labor as a species of slavery, and take their revenge by doing as little as they can, and by wasting and spoiling the material upon which they labor. Oftentimes the contractors are compelled to bribe the prisoners with tobacco, &c., in order to get a reasonable amount of work from them, the bribing being an expensive matter. There are, also, in every prison, sulky, ugly, troublesome men, and as much of the prison work is done in gangs or "teams," one ill-tempered man will often destroy the labors of a half dozen others. The force is also continually shifting, injuring its efficiency.

vict labor rests primarily upon its necessity as a reformatory measure. Its value in this direction is very great. The prisoners gain in skill, in self respect, and in willingness to work, and go out into the world better citizens, and there is far less reason to expect that they will continue to be a public burden, either as paupers or criminals, than if they are allowed to spend their prison life in idleness. Their employment reduces thus in two ways the burden of taxation, of which, in the end, labor bears the burden.

**Largest Oil Tanks in the World.**—There have just been erected at the works

as required. The new tanks add about one-quarter to their previous capacity.

## A Plan for the Registration of Mail Packages.

Numerous complaints have been received at the Post Office Department, especially from retail merchants in the larger cities who fill orders for their customers through the mails, that packages of merchandise deposited in the post office often fail to reach their destination. In a few cases investigations made by the special agents of the Post Office Department disclosed the fact that the thefts complained of occurred before the letters or packages came into the possession of the postal authorities. In some instances the dishonest persons were in the employment of the firms who made the complaints. The difficulty of detecting such thefts as these has suggested to the Postmaster-General the importance of adopting some system by means of which the responsibility for losses of this kind can be definitely fixed.

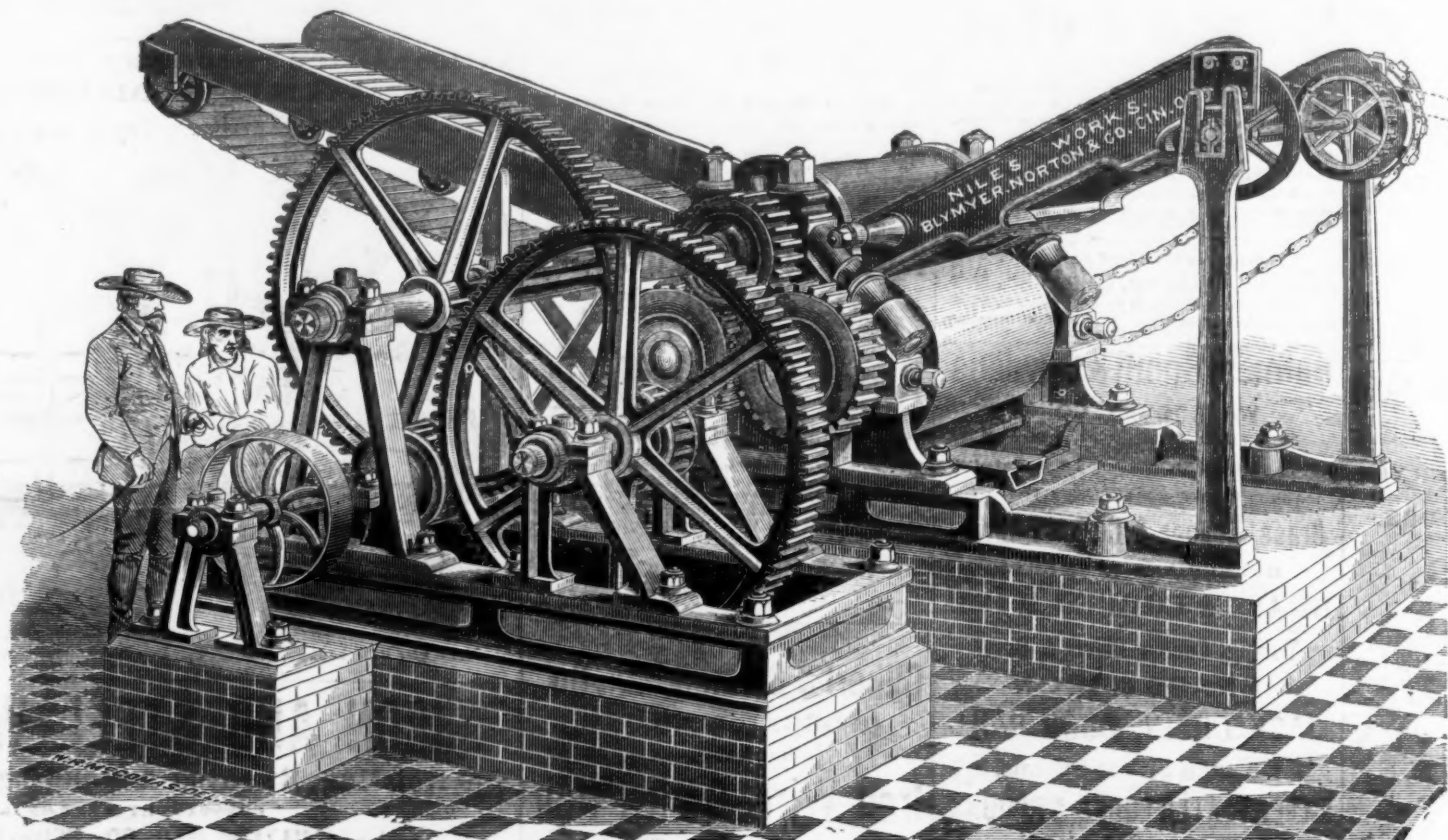
With this end in view, he has recently been in correspondence with Mr. A. Clifford Eskell, of London, who has given the subject considerable attention, and who thinks he has invented a plan that will be practical, peculiar, and a source of revenue to the Post Office Department. He proposes that the government shall issue printed forms of receipts for letters, about three inches long and two inches wide; that they be put up in the form of books, perforated at one end so that they may be easily removed, and gummed on the back of one end so that they may be reattached either to the original book or to the pages of a letterbook. The blanks, he suggests, can be sold by the Post Office Department at the rate of two for a cent. When any person makes up his mail to be sent to the post office, the plan is

that a copy of the address of the letter shall be written upon one of these blanks and sent to the post office with the letter itself. When these are handed to the post office clerk he would be required to stamp the receipt and return it, but would make no mark upon the letter itself not now required for cancellation and date. The receipts, with the post office stamp, could be preserved, and would be evidence that the letters or packages with which they corresponded had been deposited in the post office.

Mr. Eskell thinks that this system would also act as a wholesome check upon letter-carriers delivering mail matter, as they would never know whether the letters and packages which they handled had been received for or not. The plan, which is explained in much detail by Mr. Eskell, and illustrated by samples of the proposed blank receipts, will probably be submitted to Congress by the Postmaster-General, with the recommendation that it be at least experimentally adopted.

## How the Silver Agitation is Regarded Abroad.

The Pall Mall Gazette says: The American Cabinet has come to an important decision with respect to the 4 per cent. bonds, the issue of which has been checked by the silver agitation. It is settled that the Secretary of the Treasury shall, "as soon as practicable," invite public subscription to the new loan, "and shall so conduct the negotiation that persons in all parts of the United States shall have free and easy opportunity of subscribing to bonds of any amount the law authorizes." The meaning of this is plain. The syndicates of bankers through whom Secretary Sherman must act in placing the 4 per cent. bonds on the European market, have informed him that there is no chance of getting them taken here or above par, unless in some way or other the alarm excited by the Bland bill can be dispelled. If, however, the American people themselves can be induced to take up the bonds largely, the effect will soon be felt on this side of the Atlantic. In the meantime a recovery in price is already perceptible, the European investor being encouraged by the demonstrations reported from New York and Philadelphia against the silver remonetization scheme. But it must be borne in mind that what we hear of these demonstrations comes to us entirely from the Eastern States, and that in the West the popular feeling is unconquerably bent upon getting "cheap money" of some sort legalized in the supposed interest of public and private debtors. The West is now the dominant power in the Union, and if the Bland silver bill falls through we may be sure that other attempts will be made to attain the same ends with an energy increased by the first check.

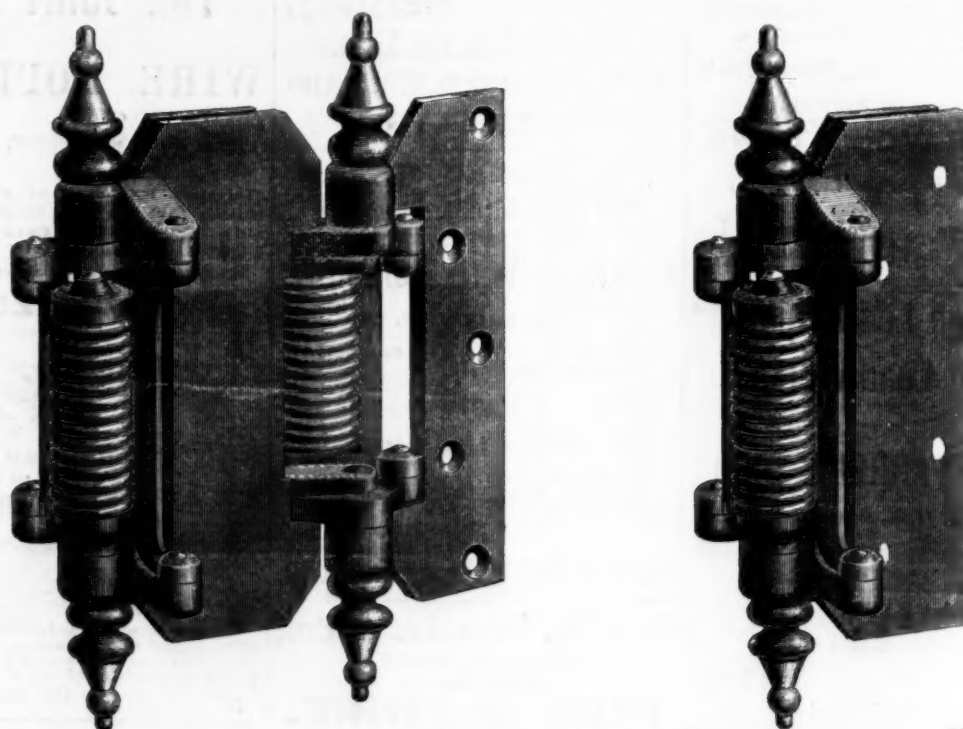


THE NILES SUGAR MILL, BY R. H. ALLEN & CO.

at 43 cents a day, and most of the remainder on overalls, running sewing machines, &c., earning about \$1.25 a dozen. At Fitchburg, chair-seating is done at 3 cents each for common seats, and some of the convicts are employed on a farm. At Worcester, chair-seating is done at 2 1/2 cents for common chairs.

These are some of the drawbacks which attend the employment of prison labor. We believe they are so great that, except in rare instances, contractors cannot make large margins of profit from it. The surest proof in support of this opinion is the fact that when new contracts are to be made there is no great competition for this labor.

of the National Storage Company, Communipaw, New Jersey, three enormous oil tanks, the largest ever built. Their dimensions are: Diameter 90 feet; height 30 feet; and their capacity is 35,000 barrels. There were used in their construction 372 tons of the best rolled iron, the plates of the lower courses being three-eighths of an inch in



GEER'S DOUBLE AND SINGLE ACTING SPRING BUTTS.

We have entered into details thus that the exact facts, not generally known, may be made the basis of the current discussions upon the subject. Certainly these prices are low—far lower than we supposed until we obtained the facts. To recur to the question, Can honest labor live in competition with prison labor at these prices? let us look at a few facts.

First the quality of this prison labor must be considered. It never does first class work. Most of the convicts are entirely unskilled. Worse than this, they are usually a lazy, shiftless set, unused to any kind of work, and averse to performing any if they can possibly escape it. They regard

Labor will always bring all it is worth in the open market, and it is certain that if it is really worth seven cents a day, some one will be found to hire it rather than permit it to be taken for six. Prison officials get all they can for it. In so far as prisoners perform any labor, they of course take it from the hands of the honest laborer; but so far as competition in price is concerned, we do not believe it ever lowered the price of honest labor a penny. In many instances, manufacturers who have tried this labor have abandoned the experiment, finding it more profitable to hire free labor at current rates.

The argument for the employment of con-

thickness; those of the upper courses three-sixteenths. The manufacturers of the iron are Graff, Bennett & Company, of Pittsburgh, Pa., and the builder is Mr. James Cuddy, of the Vulcan Iron Tank Works, Pittsburgh. The iron was prepared and fitted at the shops of the builder and transported via the Pennsylvania Railroad to the locality now known as the great depot of petroleum for the refining trade of New York and vicinity. There were previously on the ground at Communipaw 15 large tanks, three of them 68 feet in diameter, built by Mr. Cuddy last spring. Sometimes there are stored there not less than 400,000 barrels, ready for distribution to the refiners



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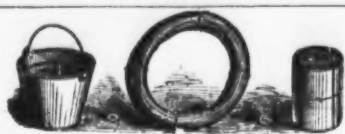
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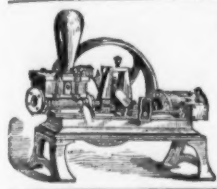
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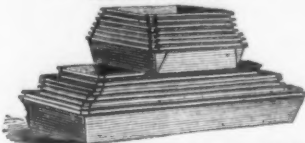
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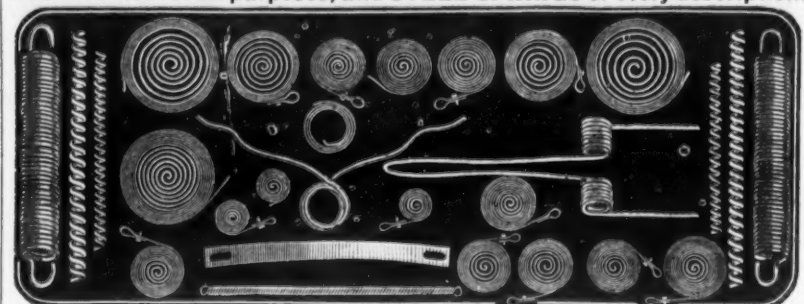
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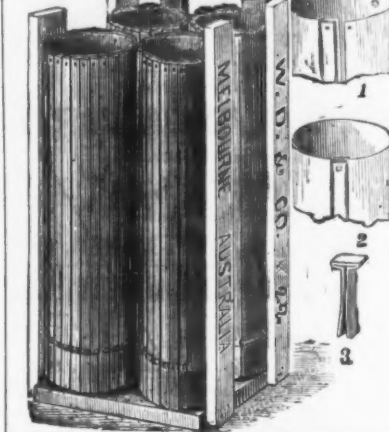
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This article is destined to revolutionize the sale of Stove Pipe. Fifty joints of 5 in. are securely packed in a case 10 in. square by 24 in. long, inside, thus occupying hardly more room than tin plate, and securing lowest rates of freight. Entirely made by machinery, every joint is exactly alike, and fits together with the greatest accuracy and ease. A child can adjust it, no tools being required. When put together it forms the strongest and most perfect pipe in the world. Over each of the rolls is drawn one joint of pipe to protect the others from dirt and moisture, thus keeping it in perfect condition always. The following are net cash prices, viz: 5 in., per joint, 12c.; 6 in., per joint, 13c. Other sizes in proportion, and made to order when desired. Packed 50 joints in a crate, for which no charge is made.

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For Circular, Mulay, Mill, Gang, Drag, Pit and Cross-Cut Saws.

**Sheet Steel**

For Springs, Billet Web and Hand Saws, Shovels, Cotton Gin Saws, Stamping Cold, &c., &c.

**SIEMENS-MARTIN (Open-Hearth) PLATE STEEL**

For Boilers, Fire-Boxes, Smoke Stacks, Tanks, &c.

All our Plate and Sheet Steel being rolled by a Patented Improvement is unequalled for surface finish and exactness of gauge.

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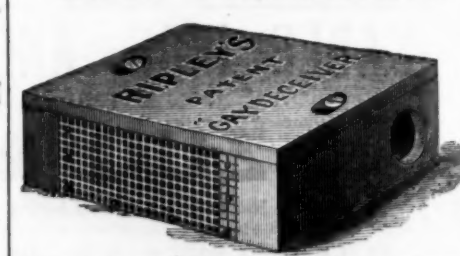
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**Driven or Tube Wells for Large Water Supplies.**

(Concluded.)

Another method of introducing a gravel bed was employed in a dug well at Lewis-ham, in Kent. The dug well became dry during last summer, and to obtain a fresh supply a tube well was driven below the bottom of it and water in a fine silver sand obtained. Gravel was thrown into the dug well, and by its weight gravitated to the spot from which the sand was being drawn. The operation of pumping out the sand and replacing it with gravel was continued until the water became entirely free from sand, and was so plentiful that two pumps were attached to it and the next house supplied from it. The method has not yet been tried for large supplies, but several engineers, and among them some members of this society, have expressed a very favorable opinion of the feasibility of carrying out water works on a large scale in localities where quicksand has hitherto baffled all attempts at making wells. One great advantage of this gravel filter is its imperishability, and, of course, if the area of the gravel bed is made sufficiently large, the velocity of the water is not sufficient to bring the grains of sand within the area acted upon by the pump, and it is not, therefore, likely to become choked like a filter of small dimensions. From some gravel a few grains of sand may at times come into a tube well, and yet not in sufficient quantity to necessitate a sand tube. A grain of sand, however, getting under the clack of a pump may cause it to lose water, and when a pump attached to a tube well loses its water, it causes agitation in the soil around the perforations, and other grains of sand come to keep the first one company. If no worse harm be done, annoyance is caused by having to prime the pump before using it. To obviate this a top strainer is placed immediately below the pump, with a flange to retain it at the top of the tube. This effectually protects the working parts of the pump from injury, and can be easily got at if necessary. The greatest depth that a tube well has been sunk—within the knowledge of the author by simply driving—is 110 feet, at Deal, in Kent. The strata was brick-earth, gravel and chalk, and an interesting illustration of how perfectly the tube well isolates the spring it draws from was afforded. The tube of 1 1/4 inch internal diameter was driven down 18 feet, and water of brackish quality was found. At 45 feet fresh water was obtained, and on driving to 116 feet water was pumped as salt as brine. Thus the presence of fresh water between two salt springs was ascertained, and a supply for a steam flour mill and domestic purposes was secured; and although some three years have passed, the water remains as fresh and pure as ever. At Sprowston Hall, near Norwich, a 2-inch tube well was driven, and passing through contaminated water, reached a spring in the chalk at 111 feet, which analysis proved to be of unusual purity. At Strasburg, a few years back, a tube is said to have been driven to a depth of 120 feet.

As an exceptional instance of the rapidity with which tubes can be driven in a favorable stratum, it may be mentioned that at the Gillingham Cement Company's works in Kent, a 1 1/4-inch test tube well was driven 83 feet in a single day; a sample of water was taken for analysis, and the well withdrawn in about the same time. At the Thames Haven Company's landing wharf, a test well was driven 53 feet in one afternoon.

When a stratum proves of too dense and compact a nature to drive into, or if rock or stone be met with, the impediment is overcome by making a bored tube well. Wrought iron tubes (generally perforated up for a few feet) of great strength, and joined together by means of steel sockets, are employed, and instead of a pointed end the tube is open, but is provided with a strong steel shoe. The method of boring is mainly the same as that employed in ordinary artesian wells, but in certain strata, such as sandstone rock, hollow boring rods are used, and the pulverized stone is pumped up through the rods, which obviates the withdrawal of the chisel and lowering of a shell to bring up the debris. The mode of pumping and development of supply is, however, entirely peculiar to the tube-well system, and the coupling of wells together is also applicable, and in many cases advantageous.

In putting down a group of bored tube wells, it is advisable (particularly where the water runs in seams) that the pipes should be carried down to different depths, as by so doing they are less liable to rob each other than if the length of the wells was identical. They may be alternated—say, one well 150 feet, the next 100 feet, and the third 150 feet again, and so on. For town supplies, and if land be difficult to obtain, the tubes may be driven along the roadside and the mains laid in a subway, and merely space secured sufficient for the pumping station.

The importance of the pump being directly connected with the tube wells is very great, as, by the removal of all atmospheric pressure on the water in the tube, the effort of every stroke of the pump is to draw the water to the tube, and, to prevent a vacuum, fresh water flows to the spot. Now, when water is drawn from an open well or bore pipe, the level of the spring is merely maintained by gravitation. There is no drawing of the water into the well; it simply percolates into it at the pace that the particular stratum will allow it. Further, the disintegrating action of the pumps, caused by the tilting described in the previous paper, opens all the fissures round the tube well, and adds very largely to the supply. The object of the perforations in the bored well tubes is to enable the disintegrating action of the pump to have full effect, as the jets of water sent out laterally are found to produce more marked results than the vertical movement of a column of water in the bore hole. As the boring progresses, the pipes are driven as deep as the hole has been made, or, if possible, a few inches lower. This practically closes the pipe and allows the perforations to be utilized in the tilting of the pumps, and such a drag is put on that particular part of the bore hole that channels of supply are opened which the pump, if acting on a more extended surface, would leave undeveloped.

If this process be repeated from time to time, by means of a second perforated pipe carried down inside the permanent well tube, it will be known exactly from what part of the bore hole the water really comes, and the supply is augmented and developed in detail, and is finally all utilized upon the withdrawal of the internal tube. Fig. 5 illustrates the process just described. Bored tube wells have been already made to depths exceeding 300 feet, and through limestone and other rocks, and are capable of being made to any depth that an ordinary artesian boring can reach.

It may be interesting to refer to some particular instances. At Messrs. Warwick's brewery, Newark-on-Trent, a bored tube well of 5 inches internal diameter was made about 95 feet deep through red marl, bands of stone and gypsum. The supply upon first connecting the pump did not exceed 1500 gallons per hour, but after four days' steady pumping and tilting, 6000 gallons per hour were obtained, and came with the greatest freedom. The pumping engine was worked by steam, and the tilting was managed by a tap in the suction pipe, which at frequent intervals admitted air, and caused the rapid alternate vertical motion of the water in the tube well which is so effectual in disintegrating the water-bearing stratum.

At Messrs. Truman, Hanbury & Buxton's brewery, Burton-on-Trent, two 5-inch bored tube wells were put down through hard marl and gypsum to a depth of 114 feet, and coupled together, yielding an ample supply. At Birmingham one 5-inch tube well was bored through red marl 200 feet to the sandstone, and enough water obtained to supply the Lower Grounds, Aston Park, with its ornamental waters, fountains and extensive gardens. The proprietor of the Lower Grounds stated that by the use of this tube well he was enabled to entirely dispense with the town water, and thus save an annual rate of £300 (\$1452). Coming nearer home, many tube wells have been sunk in the London basin.

At West Thurrock, in Essex, about 19 miles from London, the Tunnel Portland Cement Company is pumping from two 5-inch tube wells, about 80 feet deep, and 220,000 gallons of pure and clear water per day of 10 hours. At Messrs. Lawrence & Wimbles' cement works, Northfleet, one 5-inch tube well yields 60,000 gallons per day. The aggregate daily supply, therefore, of these three wells is 280,000 gallons. They have been regularly pumped for about two years, and the supply shows no sign of diminution. The cost was under £100 each (about \$500). Hence, for less than £300, a constant daily supply of 280,000 gallons has been obtained. The 16,000,000 gallons required by the Board of Works' scheme could, therefore, under similar favorable conditions, be obtained at an outlay of about £18,000 (\$90,000). The water level in the tube wells at West Thurrock and Northfleet stands at only 14 feet below the ground level, and the pumping engines are on the surface. This fact is important, as indicating that the scarcity of water in the heart of the London basin is owing to the porosity of the chalk being insufficient to conduct rapidly a supply to meet the present demand of existing wells in the metropolis, and not to any want of water in the outer circle of the basin. At Bermondsey and other places bored tube wells have been put down in the chalk to a depth of 200 feet, and at Anerley to a depth of 370 feet; but in the latter case, although the diameter of tube was 7 1/2 inches, a free supply could not be obtained owing to a fault of gray chalk, which contains but little water.

From the supplies given by tube wells of various diameters, it will be noticed that the quantity obtained does not so much depend on the size of the tube as on the nature of the strata. The tube well is really a suction pipe, drawing from nature's reservoir instead of from a limited receptacle in the shape of a dug well. For this reason it is far better to sink a series of comparatively small wells, and thus draw from several points, than to attempt to drag an enormous body of water to a single spot.

It is said that the first tube well consisted of a pointed bamboo driven into the earth, and the pump was a "nigger" who sucked the water through the pores of the cane. Now we see factories, breweries and towns deriving from them enormous supplies, and it is not improbable that coupled tube wells in the chalk may furnish the solution to the London water supply problem, and give the capital of the empire a constant supply of pure sparkling water, instead of the doubtful liquid that has hitherto been furnished from Father Thames and kindred sources.

**Cornish Pumping Engines.**—The number of pumping engines reported for November is 16. They have consumed 1502 tons of coal, and lifted 10.9 million tons of water 10 fms. high. The average duty of the whole is, therefore, 49,000,000 lbs. lifted 1 ft. high, with the consumption of 112 lbs. of coal. The following engines have exceeded the average duty:

	Millions.
Dolcoath—8 1/2 in.	54.6
Mellanear—7 1/2 in.	58.9
Mellanear—Gundry's 8 1/2 in.	50.0
West Basset—Grenville's 7 1/2 in.	49.8
West Basset—Thomas's 6 1/2 in.	51.2
West Wheal Frances—8 1/2 in.	54.3
West Wheal Seton—Harvey's 8 1/2 in.	59.4
West Wheal Seton—Rule's 7 1/2 in.	62.5

Mr. John Fernie, a member of the Institution of Civil Engineers, writes to the London Times that at the Paris Exhibition next year England need fear no European rival in the department of machinery, "but there is no doubt we shall have a formidable rival in America." He denies Professor Goldwin Smith's recent statement that while the United States are likely to oppose England in the manufacture of machinery, this machinery will be only of the heaviest and coarsest kind. "The very opposite of this," he says, "was shown by the exhibition at Philadelphia. That exhibition," he continues, "where two hundred buildings of various magnitudes, ranging from a log hut to structures of 10, 14, and 20 acres, were placed in a beautiful park of 250 acres, and this again in the center of the grandest public park of some 2000 acres, each of these buildings being as different and unique as the taste of as many different builders, had a picturesqueness and beauty which I fear will never be matched again."



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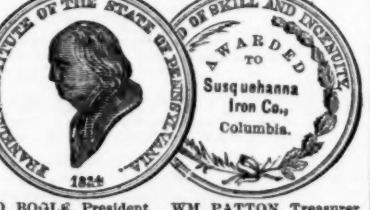
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## American and English Locks.

The following article, which appeared not long since in the *Ironmonger*, has caused no little stir among the lock makers on both sides of the Atlantic. The article was evidently called out by the fact that American locks were entering the English market to a considerable extent.

"A good deal has been said and written lately about the alarming competition in English hardware in general and locks in particular, and reports have been uniformly adverse to the chances of English makers against their smart rivals. We are, however, enabled to state a fact or two which seem to suggest that some of the evil prophecies concerning the English producers are, to say the least, premature. An enterprising padlock manufacturer in South Staffordshire was recently invited to tender for a large order for padlocks of an American pattern and against American producers. When the tenders were opened, that of the South Staffordshire maker was found to be the lowest, and he has secured the order, upon which he is now busily engaged. We are, moreover, informed that other padlock makers in the same district are producing locks of American design, and supplying sources of demand in which until recently the Americans enjoyed quite a monopoly as regards goods of that particular class.

"Then as to the door locks, there are indications of a reaction in the late *furore* for American makes. Readers of the *Ironmonger* will remember how, a few months ago, it was predicted that American locks would supersede in our own colonies the productions of the mother country. The prophets have again proved wrong. After a trial of the American locks of middle and lower qualities, the prejudice in favor of English makes is returning. Nor if this to be wondered at when the two makes are placed in fair comparison. American locks are, it must be granted, marvels of cheapness, and the expenditure of manual labor in their production is almost nil. As a rule they are of cast iron throughout. The cases, the bolts, the keys and the staples are all cast. The fineness of the casting is so great and the parts fit into each other with such perfect exactness that they do not so much as require the finishing stroke of a file. English malleable castings are nowhere in comparison. But in this practically dispensing with manual and patient labor; in thus turning out a gross of locks faster than English makers turn out a dozen; certain features of the articles—which used to be thought indispensable—have necessarily to be sacrificed. The ordinary American cast door lock has, for instance, no wards, the only security being in the "fancy" or shape of the keyhole. A few strokes with a file will of course modify this "fancy" or shape to suit any key, and then all "security" is destroyed. Keys of identical shape and design, which are produced by the million, must have a low standard of security, whether they are of cast iron or of wrought. English keys are "cut" or "warded" by hand, and thus a maximum of variation, which in this case means security, is attainable.

"Machine-made keys, however ingenious, have the same fault as cast keys, in that they do not and cannot in the nature of things sufficiently "differ." It is one of the boasts of Messrs. Chubb, the eminent lock-makers, that all their locks and keys are made without the aid of machinery, and most English firms who make locks of a medium class, eschew the meretricious aids at which Americans have clutched to increase and cheapen production at the cost of reducing to a minimum, if not altogether destroying, the chief value which a lock is supposed to possess. That English locksmiths may glean useful lessons from their American rivals is not to be denied. In regard to beauty of design, expedition in supplies, neatness and convenience in the style of packing and packing goods, and in other matters the American lockmakers have certainly displayed a spirit of enterprise which is truly commendable, but as yet they have not assailed the English locksmith in his hitherto invulnerable point—the security and practical utility of the article he produces.

Shortly after this the following appeared in the *Furniture Gazette*. It was signed "A Workman."

"There is something more to be said on this subject, treated of in the *Furniture Gazette* for October 27th, and that not from a manufacturer's, but from a workman and builder's point of view. Very glad indeed shall I be to find the English maker holding his own against the American locksmith, but to do this it will be necessary for him neither to despise nor ignore the lessons taught him by his competitor on the other side of the Atlantic.

"As a workman, I have been called upon to fix almost every kind of English-made lock which is used in a dwelling house; as a builder, having hundreds of houses to keep in repair, I have been constrained, times without number, to anathematize the makers of the miserable combinations called English locks.

"In making a fair comparison between English and American locks, we have to lay aside (if we can) our prejudice against the foreign production, and consider the articles in reference to, first, their price; second, their adaptability; third, their durability; and fourth, their security.

"Let us take the American 4-inch rim lock, which is the article that competes with the 6-inch English rim lock.

"The American lock, neatly packed in boxes with the furniture (of which more presently), costs complete about 1/9 retail to the builder. Nothing of English make, except some abortion which cannot be called a lock, can be bought under 2/6 to 2/3. An American mortise lock, which lies before me, costs 2/11, including furniture, while an English one of the same grade costs 2/9, without furniture; so that in the matter of price the advantage is on the side of the American article.

"Next as to their adaptability or fitness for the purpose for which they are designed. The American rim lock is only half the size of the English one, it is neat in design, takes less trouble to fix, can be reversed in a moment from right hand to left, and is quite as

heavy and strong as is necessary. This quality of reversibility, though it may not be of much importance to the cabinet maker, who is always within arm's length of his store room, is of great advantage to the builder, who may find, after sending a number of locks a good many miles, that, in consequence of mistakes or alterations in the hanging of his doors, two or three of his locks are "wrong hand." I know I shall be told that English makers supply a reversible lock; but I answer, "Not in the ordinary way of trade." If I want an English lock to reverse I must pay specially for it, whereas the American maker seems to consider the reversible bolt arrangement to be as much part and parcel of an ordinary lock as is its keyhole. There is no cutting of the door edge required in fixing an American rim lock, and I am at a loss to know why it should be required in the case of the English one, for I have never yet seen any earthly necessity for the projecting flange which has to be let into the door edge; it adds nothing to the security of the door, it receives no strain in any attempt to force the door from the outside, and it certainly does not add to its beauty.

"The staple of the American lock is of cast iron, made to match the lock itself, and is no larger than is required for the work it has to perform. The plates which cover the lock, having slight projections or bosses cast upon them, give a much better bearing to the 'follower' than the sheet-iron casing of the English lock of the same class. The English makers seem to throw away an amount of labor in unnecessary work and material, while the Americans strive to economize both.

"The English rim lock which lies before me weighs nearly twice as much as its Yankee competitor, the keyhole is plated with brass on both casings, and the brass is polished; whereas, if the brass had been used to bush the follower, where most of the wear of the lock is, it would have been to the advantage of the article.

"The edges of the lock which lie next the door, and consequently out of sight, are polished, an economic sin which Uncle Sam would not have committed. The same may be said of the edges of the feather spring and other portions of the internal part of the lock. The staple is of the ordinary English type, half an inch wider than is necessary, with a piece of brass riveted on the edge to receive the latch. Only those who have to contend with the repairs know the annoyance caused by these miserable things, which are for ever breaking off to the detriment of lock, door, casing and the temper of both tenant and landlord. Indeed, years ago, before ever an American lock was introduced into the English market, I insisted upon being supplied with a cast-iron box staple for all our drawback locks, finding that it was cheaper to pay for an extra staple than put up with the annoyance and loss caused by the ordinary one.

"Much the same may be said of the mortise lock. The Americans make a lock in which there is nothing superfluous, while the English manufacturer seems to delight in grinding and polishing up the outside of a lock, which is never seen after it is fixed. Why, in the name of common sense, need there be labor wasted in polishing up the body of a mortise lock, which is concealed from human eyesight from the moment it is fixed, unless it be taken out, years hence, to be repaired, when the chances are it will be thoroughly rusted? Now a word or two about the furniture. The Americans supply a set of furniture with their rim locks formed of some mineral composition so strong that it can be thrown for a considerable distance without injury. The shape is rather different to ours, but the grip is much better. The roses have teeth cast on the side which fits to the door, to prevent them turning with the spindle. Each spindle carries six small washers, which serve the double purpose of taking up part of the slack and diminishing the friction. One knob is firmly fastened on the spindle, the other carries a screw which is long enough to screw into the spindle, and the spindle is tapped to receive it. Contrast this with the English furniture.

"Here we have a spindle carrying two brass knobs, each knob consisting of two parts, a neck into which the spindle is roughly fitted, and a hollow shell which grips the neck and forms the handle; and, as everybody knows, is likely at any moment to turn round in one's hand. The screw is tapped only into the neck, and has a round end which enters a countersinking in the spindle; and, as before, everybody knows the result, the knob soon works loose, the screw drops out, and the unfortunate builder gets the blame.

"Next as to their durability. I am strongly of opinion that a few years' wear will prove that the American locks will contrast favorably with our own in this particular. Now a word about their relative security. Let some of your readers take, say 50 English locks of the class about which I am writing, and they will be surprised to find how many of the keys will "pass." Take the ordinary drawlocks, say at 3/3 each, and try a street of artisans' or clerks' houses, and the tenant will be horrified to find how many of his neighbors could open his front door if they chose. The small rim or mortise lock, of which I am writing, is only for the inside of our dwellings, and we seldom lock our inside doors except against our children; and even if we did, an American lock would be quite as proof against a skeleton key as would an English one, and neither of them would stand any chance against the burglars' usual picklock, the "jimmy."

"There is no manner of mistake about the quality of the castings, and English manufacturers may hang their heads with shame when they look at castings which are almost as smooth when they come out of the sand as their own work is after it has been ground. How it is I know not, but it is a fact that on an English eye these castings are marvels of cleanness, and we shall do well to set our house in order or we may find ourselves beaten on our own ground. I shall be glad to see English goods maintaining their position, but it can only be done by leaving, to some extent, our old beaten tracks, and improving our modes of manufacture.

"For the present, American goods have to contend against our prejudices, the separate

prejudices of proprietor, builder or architect. Locks are a class of goods sold mainly to certain classes of the community, and these classes have often conflicting interests and prejudices. Thus, the builder will not lay in a stock of American locks, lest the architect under whom he works should condemn their use; the architect is afraid to specify them, lest, if they should get out of order, the owner should blame him.

"Of course, for all locks where absolute security is required, nothing can equal hand-made goods. But if we only think of it, how few of our mortise or rim locks are ever actually used as a defense against thieves, and how slender would be the defense even if relied upon.

"It will not be wise for the ironmonger to flatter the hardware manufacturers with the notion that they are masters of the field. It would not be amiss if they would take a few builders into their confidence, and get them to point out some of the defects in their builders' ironmongery, with a view to placing themselves once more at the head of the hardware trade, for they must keep their eyes open or they will be beaten with their own weapons."

These remarks, from one who is evidently a practical man and well posted, are especially valuable.

In a later issue, the *Ironmonger*, replying to the criticisms of some of the American papers which had declared their attacks entirely unjustifiable, says:

"Our contemporaries maintain that while some American locks are made for cheapness, without pretensions to security, others are not surpassed in that feature by the best European manufactures. The combination and time locks of America, selling at \$150 to \$400, almost unknown in Europe, are practically proof against picking. Indeed, the superior skill of American burglars (who it thus appears share in the national superiority) necessitates greater security.

"The well-known Yale lock, with small, flat, steel key, is a cheap lock for store doors, closets, drawers, &c. Security is given by two to seven pins in the escutcheon. The lock can only be opened when each pin is raised exactly to the proper height. The width of the key admits 10 different "bit-tings" or depth of notches. A lock with one pin can be set up in 10 positions, in neither of which can it be opened by a key which would open it in any other. With two pins the possible number of changes is 100; with three, 1,000; with four, 10,000; with seven, 10,000,000. In drawer and desk Yale locks there are four pins, which is the lowest number. James Bain, of Glasgow, spoke highly of American locks in his report on the Centennial Exhibition (which was published in the *Ironmonger*, on page 290, 1877). Finally, Hobbs, of Boston, picked the locks of Chubb and Bramah, who failed in the attempt to pick the lock made for Hobbs by Newall, of New York.

"A workman in the *Furniture Gazette*, from an English workman and builder's point of view, says that the American mortise and rim locks surpass the English in neatness of casting, price, ease in fixing and 'furniture.' All are reversible, no useless labor is expended on them, and they are probably as durable as the English goods. 'Neither would be a protection against the "jimmy," and not one in a hundred is required for purposes of security. It would be wise for the lock-makers to take builders into their confidence to learn how to place themselves once more at the head of the hardware trade.

"In the interest of maker, vender, and user of good, serviceable and cheap articles, we invariably experience satisfaction in criticisms upon views which may be expressed upon good authority in the pages of the *Ironmonger*, for the interests of all three are identical. Nor does it matter to us whence comes the best product. If we can get it from the United States we welcome it; since we have knowledge enough of our own manufacturers to feel assurance that what an American can do an Englishman can do likewise. Consequently, that if an American makes, for example, an American lock which to-day threatens to push an English lock from the market, an Englishman will not be long before he has learned the lesson thus roughly taught him."

**The Ore Product of California last Year.**—The following is a summary of the report of the Superintendent of the California Mines: Yield of ore for the year, 217,432 tons; amount reduced, 213,683 tons; yielding bullion of value of \$1,892,485,027, of which \$938,674,547 is gold. Considerable work has been done on 1400-foot level, but not enough to determine where ore exists. Workings are much in need of repairs. Much ore has been taken from 1800-foot level. The last low grade northern portion of the level has only been partly explored, the drifts terminating in a body of poor quartz. A vast quantity of high-grade ore has been taken from 1550-foot level, considerable of good quality remaining, and a large quantity of medium grade. To the eastward of the main ore body there is a large body of low-grade quartz yet undeveloped. From 1600-foot level, 105,723 tons ore have been taken, a large amount of good quality remaining; 240 feet of ore body in the south end level is still untouched, except by the winze passing through it, showing good ore throughout. There is reason to believe that the whole block is of the same quality. There is a great quantity of ore on the 1650-foot level, but little has been taken out except at the southern boundary. Much more work will be necessary to determine the value of this level. The 1700-foot level is partially developed at the north end, but little is known of it. The ore body on the 1750-foot level, is very wide and well defined, but the greater portion of too low a grade to pay for the mining and milling. Good ore is confined to the east wall, and does not exceed 28 feet in width. It is believed that much ore exists between this and the next level below. The opening of the 1840-foot level has been commenced from the Ophir mine. A large amount of work is being done in keeping the works in repair. The report contains no recommendation of a reduction of dividends.

Iron for January 9, says: The output of the Cumberland iron ore mines for last year is shown at 1,253,910 tons.



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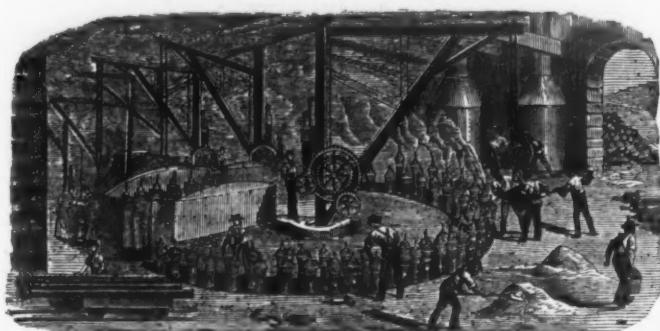
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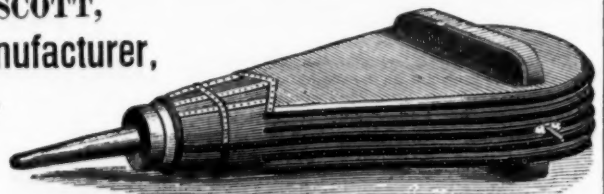
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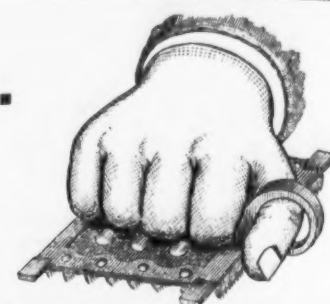
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We offer our Finished Nail to the trade with the confidence that it has no equal  
in the market. It is the genuine "Northwestern" Nail, Finished, and we give it  
our unqualified guaranty.  
Office and Factory, 56 to 68 Van Buren St., Chicago.  
**A. W. KINGSLAND, Secretary.**  
Our agents, Graham & Haines, 113 Chambers Street, New York, carry a full  
line of our goods, and will be pleased to serve you at Factory prices.

HOTCHKISS'  
Novelty Combs.

We ask the attention of the public to our Patent Novelty Curry Combs, represented above, which  
are universally acknowledged to be far superior to anything in the market, being neat and durable and  
the most convenient to handle of any comb yet produced. They are put up in paper boxes of one  
dozen each, and packed 24 dozen in a case. GIVE THEM A TRIAL. For Sale by the Jobbing Hard-  
ware, Saddlery and Woodenware trade.

## HOTCHKISS' SONS, Bridgeport, Conn.

BURLL'S IMPROVED  
Right Hand Iron Corn  
Sheller,

Price, - \$8.00.

Is acknowledged by all who have used it to be the  
**Best Hand Corn Sheller Made.**  
These facts are attested by over 70,000 Farmers  
who have bought and used them.

Principal Depot, 93 Liberty St., New York.

## RUMSEY &amp; CO., Limited,

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BRANCH HOUSE,  
L. M. RUMSEY & CO., St. Louis, Mo

## MALTBY, CURTISS &amp; CO., 34 Reade St., N. Y.

Manufacturers of  
**METAL KEY, MAPLE AND ROSE WOOD FAUCETS.**  
Also Manufacturers of  
Capewell's Giant Nail Puller, The Buell Peg Float, and the  
**VICTOR KNIFE SHARPENER.**  
ONE-HALF SIZE.

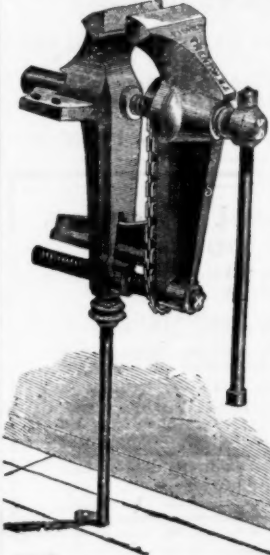


Also the ELECTRIC AND FAMILY KNIFE SHARPENER.

CENTENNIAL EXHIBITION PRIZE MEDAL AWARDED.

**WARRANTED.**

## The Double Screw Parallel "Leg" Vise



Stronger than any other, whether of Foreign or of American make,  
always parallel and holding with a tighter "grip." The jaws are of con-  
venient shape for the workman to get near his work equally well for fil-  
ling or clipping. Instead of the heavy, clumsily formed jaws of the cast  
iron Single Screw Vises of the common "parallel" type.  
Our Vise combines all the advantages of the "Peter Wright" Leg  
Vise, of strength and lightness, fastening to the floor and bench, at the  
same time greatly superior to it; it is always perfectly parallel at a  
point of opening, and never gets out of line. We now warrant this  
Vise for three years from date of manufacture stamped upon each.  
The jaws are of best Tool Cast Steel, welded on, file cut and properly  
hardened. The screws are forged of the best refined iron, and work in  
solid cut threaded boxes. The lower screw maintains the parallel position  
of the two jaws, by having exact motion with the upper working screw  
through the connecting chain which regulates it. The chain has no strain  
of the work upon it, and is therefore as durable as all the other parts.

**REDUCED PRICE LIST.**

No. 1. Jaws 3 1/2 in. x 1 1/4 in. Screws 1/2 in. diameter, Lever 9 in. long, opens 4 1/2 in. \$7.00  
No. 2. Jaws 4 1/2 in. x 1 1/4 in. Screws 1 1/2 in. diameter, Lever 13 in. long, opens 5 1/2 in. 11.00  
No. 3. Jaws 5 1/2 in. x 1 1/4 in. Screws 1 1/2 in. diameter, Lever 16 in. long, opens 8 1/2 in. 16.00  
No. 4. Jaws 6 1/2 in. x 1 1/4 in. Screws 1 1/2 in. diameter, Lever 18 in. long, opens 8 1/2 in. 20.00  
No. 5. Jaws 7 1/2 in. x 1 1/4 in. Screws 1 1/2 in. diameter, Lever 21 in. long, opens 9 in. 27.00  
No. 6. Jaws 8 in. x 1 1/4 in. Screws 1 1/2 in. diameter, Lever 26 in. long, opens 10 in. 30.00  
All sizes of these Vises furnished with swivel Attachment at same price.

THESE GOODS ARE SOLD BY THE GENERAL AGENTS  
(with special discounts to the trade.)

New York.—Messrs. **TENNIS & WILSON**—  
**RUSSELL & ERWIN MFG. CO.**—Messrs. **HORACE DUBIE & CO.** Boston.—Messrs. **GEORGE H. GRAY & DANFORTH.** Philadelphia.—Messrs. **JAMES C. HAND & CO.** Baltimore.—Mr. **W. H. COLE.** Louis-  
ville.—Messrs. **W. B. BELKNAP & CO.**

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**WITH WOOD OR IRON WHEELS.**  
A first-class article and a specialty, that will make a demand in any market and afford a good margin  
to dealers. We are prepared to furnish them in large quantities. Manufactured by  
**BRYAN MANUFACTURING CO., Bryan, O.**

**SEMPLE & BIRGE MFG. CO.,** Sole Western Agents, ST. LOUIS, MO.  
For Sale by THE NEW YORK PLOW CO., General Eastern Agents, 35 Beekman St., New York.

## GLOBE NAIL COMPANY,

MANUFACTURERS OF  
**Pointed Polished & Finished Horse Shoe Nails.**

Recommended by over 20,000 Horse Shoers.  
All nails made from best NORWAY IRON, and warranted perfect and  
ready for driving. Orders filled promptly and at lowest rates by

**GLOBE NAIL CO., Boston, Mass.**

**RHODE ISLAND HORSE SHOE CO.,**

OFFICE, 81 Canal Street, Providence, R. I. WORKS at Valley Falls, R. I.

Manufacturers of  
PERKINS and RHODE ISLAND PATTERNS of  
**HORSE AND MULE SHOES.**



# W. & B. DOUGLAS,

MIDDLETOWN, CONN.

The Oldest and Most Extensive Manufacturers of

## PUMPS, HYDRAULIC RAMS, GARDEN ENGINES

Yard Hydrants, Street Washers.

AND OTHER

## Hydraulic Machines

IN THE  
WORLD.

Awarded the GRAND MEDAL of PROGRESS at WORLDS' EXPOSITION, VIENNA, 1873, being the highest awards on Pumps, &c., also, highest medal at PARIS in 1867, and Philadelphia, 1876, accompanied by Report of Judges.

Descriptive Catalogues and Price Lists sent when requested.

BRANCH WAREHOUSES,

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## UNION MANUFACTURING COMPANY,

Manufacturers of all styles Plain and Ornamental Butts,

LOOSE PIN REVERSIBLE,

Cast Fast &amp; Loose

Drilled and Wire Jointed.  
Japanned, Enamelled, Nickel Plated  
and Real Bronze Butts. Also a full line of

IRON &amp; BRASS PUMPS.

Cistern, Well, and Force Pumps, Yards, Drive  
Well, Garden Engine and Steam Boiler Pumps,  
Hydraulic Rams, etc., and all with the most modern  
improvements.

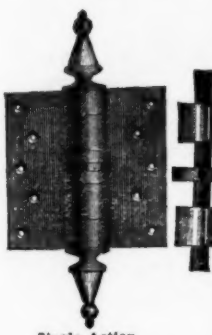
Centennial Spring Hinges.

This Hinge has two flat coil springs, very powerful. It has a heavy solid pin, giving much less friction than a hollow pin. It has broad, solid bearings in the knuckle, which do not wear down readily and let the door sag. It is Fast Joint, therefore can be used for either right or left hand. By actual test it has an average of 50 per cent. more power than other Spring Hinges in common use of same size.

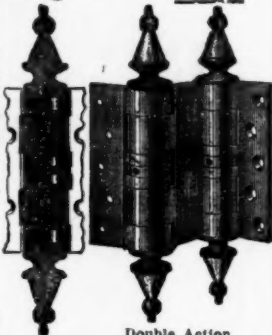
Fine Castings a Specialty.

NEW BRITAIN, CONN.

Warehouses,  
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Heaton & Denckla, 507 Com-  
merce St., Phila. (Butts.)  
Send for Illustrated Catalogue and  
Price List.



Single Action.



Double Action.

# THE IMPROVED HOWE SCALES

In Competition with the World, at Philadelphia, 1876.

TWO FIRST MEDALS, and TWO DIPLOMAS OF MERIT

The following are the points that the Judges officially announce as the basis of their award of the highest honors to the Howe Scales:

- 1st. For their Protected Bearings (the Howe is the only Scale with protected bearings), which makes the Scale DURABLY ACCURATE.
- 2d. For their Strength.
- 3d. For their Simplicity.
- 4th. For their economy in construction.
- 5th. For their first-rate material and workmanship.
- 6th. For their various original improvements and adaptations (which being patented are exclusively possessed by the HOWE).

## The Improved Howe Scales

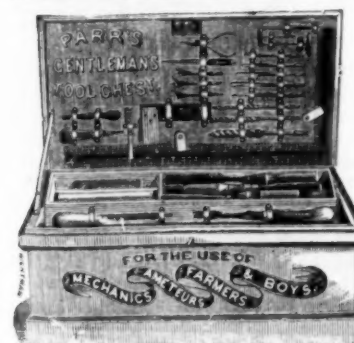
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BRANDON MFG. COMPANY, of Brandon, Vt.,

Are Guaranteed Superior to all others.

For Plans, Prices and other information, address,

A. M. GILBERT & CO., 95 to 101 Lake St., Chicago. 116 Main St., Cincinnati. 612 N. Third St., St. Louis.  
PAGE & CO., 3 Park Place, New York City. 63 Wood St., Pittsburgh.  
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ESTABLISHED 1837.  
We are pleased to inform the trade that our facilities for the manufacture of tool chests this season cannot be surpassed. We make two qualities. The first quality is made of heavy American Black Walnut, with partitions and drawers for tools, which are ground, set and sharpened especially for use. It is especially designed for mechanics and first-class amateurs and for all those in need of extra fine quality of tools. The tools in these chests, manufactured by ourselves, are of our best quality; and those supplied by other manufacturers are warranted their best goods. The second quality is a cheaper article and designed more especially for the "Y" and toy trade. The articles are of good quality and are designed for practical household use. Many years ago, when we were pioneers in this branch of trade, the English on first quality and the Germans on the second quality were formidable competitors and controlled the American market on those goods; but now I am exporting annually large quantities of the best quality to foreign countries, and those goods are scarcely known in this country. Parties engaged in the export trade cannot send a better specimen of American mechanic tools, than by procuring one of our chests, branded Geo. Parr. Consult your interest by sending for illustrated catalogue and revised price list.

GEORGE PARR, Buffalo, N. Y.



## W. S. BLUNT'S Universal Force Pumps.

Secured by Letters Patent.

These Pumps have enormous power, and are for the house or for out-door wells of any depth. They are constructed with special regard to strength, ease of working and durability. They can be immediately changed from lift to force pumps, and the air chamber can be revolved, so as to allow the handle to work at any desired angle with the spout. Having close tops, they cannot be tampered with. Attention is called to our new elegant pattern Deep Well Non-Freezing Fire Pump. Also, Blunt's Sand Vacuum Chambers—a complete protection against sand or gritty water in dug or driven wells, pits, mines and rivers. For hand or steam pumps, all sizes, from 1/4 inch to 4 inch suction pipe. Send for circulars to  
SARON WELLS, CO.,  
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St., New York.  
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& Hale, Chicago.  
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ham, Carrigan & Co., San  
Francisco, Cal.

## AGATE IRON-WARE

PATENTED  
May 30th, 1876, Feb. 27th, 1877, July 3d, 1877.

The absolute Purity and Safety of  
Agate-Iron-Ware is certified to by the  
following eminent Chemists:

R. OGDEN DOREMUS, M. D., LL.D., of College of the City of N. Y.  
S. SILLIMAN, State Chemist, Yale College, New Haven, Conn.  
HERBERT C. TORREY, U. S. Assayer, Office, 20 Wall St., N. Y.  
S. C. EATON, M. D., Analytical Chemist at U. S. Assay Office.  
S. DANA HAYES, State Assayer and Chemist, Boston, Mass.  
HENRY MORTON, Pres. Stevens Inst. of Technology, Hoboken, N. J.  
EDWARD S. WOOD, Prof. Chem., Harvard Med. Coll., Boston, Mass.  
W. M. RIPLEY NICHOLS, Prof. Gen. Chemistry, Boston, Mass.  
BOOTH & GARRETT, Practical & Analytical Chemists, Philadelphia.



Price Lists and Discounts will be sent only to  
the Trade, on application.  
LATANCE & GROSJEAN MFG CO.,  
P.O. Box 301. 89 Beekman St., New York.

## Wire Flower Pot Stands.



Fire Fenders, Fire Guards, Locomotive Wire Cloth,  
Brass Wire Cloth, Wire counter Railings, Fencing and  
General Wire Work. Manufactured by  
E. T. BARNUM, Detroit, Mich.  
Send for illustrated catalogue.

## SPECIALTY.

COAL WASHING MACHINES AND  
IMPROVED COKE OVENS.

S. DIESCHER,

Civil and Mechanical Engineer,  
Cor. Smithfield St. & 6th Ave., Pittsburgh, Pa.

Established 1838.

Bevin Bros. Mfg.  
Co.,

Easthampton, Ct

Manufacturers of

SLEIGH BELLS

House, Tea, Hand.

Gong Bell &amp;c.

Bell Metal Kettles.

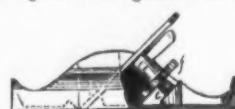


## New Patents.

We take the following abstract of new  
patents, recently issued, from the official  
record:

### BENCH PLANE.

To L. Bailey, Hartford, Conn.—Oct. 16.—  
The plane bit is adjusted by means of a disk  
borne upon a screw, and provided with a  
pin working in lateral grooves in the under



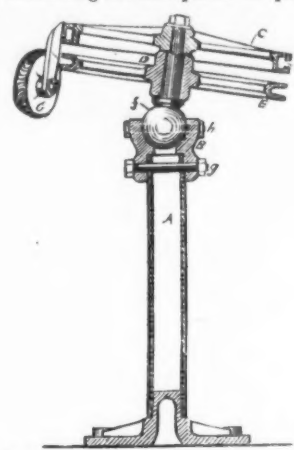
side of the bit. The body is of cast metal,  
with the sides concave or hollowed near the  
ends, for giving the user a firm grasp of the  
tool.

1. A metallic plane body having the sides  
curved or hollowed.  
2. In combination, the screw, nut and  
pin disk j, borne upon the screw, and the  
grooved plane bit.

### GUIDE PULLEY FOR ROPES AND BANDS.

To Geo. H. Reynolds, New York, N. Y.—  
Oct. 16.—The device is designed for supporting  
and guiding the ropes used to drive or  
transmit motion to machinery in mines.

1. The combination of the axial pintle or  
pivot D, upon which the angle sheave ro-  
tates, the supporting post or column A, and  
the positively clamping ball-and-socket joint  
f B, connecting the said pintle or pivot di-



rectly with the said post or column, and pro-  
viding for the adjustment and securing of  
the said pivot or pintle at various angles  
relatively to the said post or column.

2. The combination, with the divided  
clamping socket B, which forms part of the  
ball-and-socket joint connection between the  
pintle or pivot D and the post or standard  
A, of the bolt g, which clamps the two sec-  
tions of said socket securely to the post or  
standard without clamping the ball f on the  
pintle or pivot, and the bolts h, which  
clamp the said sections on the said ball f.

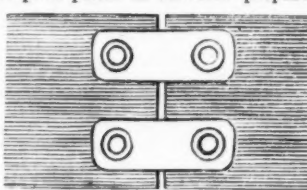
3. The carrier C, in combination with the  
angle sheave E and the pintle or pivot D,  
whereby said sheave carrier is adjustable in  
concert with the angle sheave.

4. The combination, with the sheave car-  
rier C, of the rope guiding and carrying  
sheaves G G, made adjustable on and around  
said carrier.

5. The combination of the angle sheave E,  
the carrier C, the rope guiding and carrying  
sheaves G G, adjustable around said carrier,  
the universally adjustable pintle or pivot D,  
the clamp B, and the post or column A.

### BELT FASTENING.

To A. C. Tyler, Philadelphia, Pa.—Oct.  
16.—An improved belt fastening, consisting  
of strips or plates of rawhide prepared by

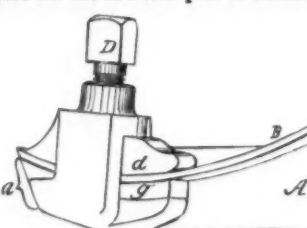


immersion in neat's foot oil, substantially as  
set forth, and adapted to be secured to the  
ends of a belt.

### CUTTER FOR LATHES.

To John Du Bois, Williamsport, Pa.—Oct.  
30.—1. A lathe tool consisting of a stock or  
body adapted for use in a tool post, and a  
thin blade or sheet of steel lying upon and  
adjustably secured to the stock, and sus-  
tained immediately under its cutting edge  
thereby.

2. The lathe tool consisting of the stock A,  
adapted for use in a tool post or holder, and



provided with the overhanging nose a, and  
the thin blade of steel B, secured horizontally  
and adjustably thereon, and sustained to the  
extreme cutting edge by the nose.

3. The combination, in a lathe tool, of a  
thin steel blade or sheet and a sustaining  
stock adapted for use in a tool post or  
holder, and provided with a nose or point  
extended under and sustaining the blade at  
its extreme forward edge, the two being  
flush with each other at the front end.

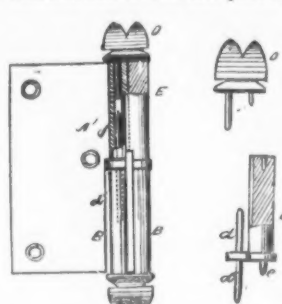
4. In a lathe tool, the combination of a  
thin steel blade, a stock or holder, substan-  
tially as shown, having a point or nose  
extending under and sustaining the extreme  
forward end of the blade, and a clamping-  
block, secured firmly on top of the blade,  
and extending forward nearly to the edge of  
the same, to prevent it from breaking or  
chattering.

5. The combination of the stock A, having  
the oblique mortise, and the nose a and  
screw D, with the thin steel blade B, and the  
block d resting thereon.

6. The combination of the stock A, having  
the nose, the mortise and the screw, with  
the removable blocks d and g, and the thin  
blade B.

### HINGE.

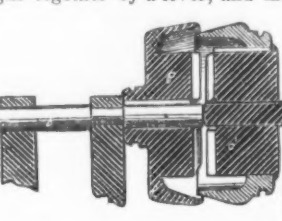
To Benj. Fahnestock & Henry F. Peckham,  
Watsonville, Cal.—Nov. 6.—A slight novelty  
in the construction of a double-pin reversible



hinge, sufficiently pointed out in the claim.  
The leaf A, having formed on it two eyes,  
B B, and the leaf A', having formed on it an  
eye, E, in combination with the reversible  
eye F and its pins d d' e.

### CLUTCH FOR SHAFT-COUPLING.

To A. A. Osborn, San Francisco, Cal.—  
Nov. 6.—The sliding-cup couplings are first  
brought together by a lever, and motion is

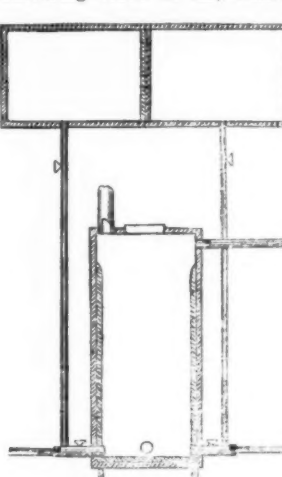


imparted to one shaft until it is moving at  
the same rate of speed as the other shaft;  
then the positive clutches are thrown in con-  
tact, when the shafts are connected together  
as if they were one.

The combination, with shafts a and b, of  
the movable parts c g of the coupling, and  
the stationary portion c', having the movable  
portion f, with their operating levers.

### MANUFACTURE OF OXIDE OF TIN.

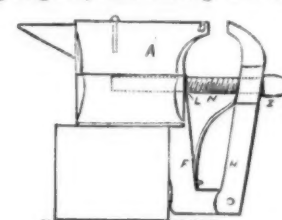
To J. Milton Sanders, New York, N. Y.—  
Nov. 6.—The method herein specified of  
manufacturing oxide of tin, consisting in



subjecting the scrap tinned iron to a heat  
sufficiently strong to volatilize the tin, and  
oxidize the same by the atmosphere passing  
into the furnace, and then receiving the tin  
oxide in a chamber, in which it is separated  
from the products of combustion.

### ANVIL VISE.

To A. H. Anderson, Nebraska City, Neb.—  
Nov. 6.—The anvil A, constructed with the  
biting edge D, and having the threaded



aperture L on its rear end, in combination  
with the angular bar F and vise jaw H, pro-  
vided with the aperture I, in which, in con-  
junction with the aperture L, the vise screw  
N operates, the upper edge of the jaw H  
being flush with the upper surface of the  
anvil A.

A "Tolling" Machine.—In the current  
number of *Fors Clavigera*, Mr. Ruskin gives  
the following note from a correspondent:  
"Here's a good thing for 'Fors.' A tolling  
machine has been erected at Ealing Cem-  
etery at the cost of £80, and seems to give  
universal satisfaction. It was calculated  
that this method of doing things would (at  
300 funerals a year) be in the long run  
cheaper than paying a man threepence an  
hour to ring the bell. Thus we mourn for  
the departed!"

In the south of France the export of wine  
has become so large that the coopers cannot  
find oak enough in their own country, and  
are obtaining it from Trieste, Illyria, Amer-  
ica, and other parts. It is computed that  
at least 80,000 sters of wood are used in  
France alone every year in the making of  
lucifer matches. Toys also make a great  
hole in the supply of wood. It is said that  
200,000 dozen of children's drums are made  
monthly in Paris alone, requiring 30,000,000  
of bodies and 60,000,000 of drumsticks per  
annum. Nearly the whole of the wood used  
for these drums comes from Villiers-Cotte-  
rets, and it represents the produce of nearly  
50,000 acres of timber land. Whole villages  
in the Haute Soane are employed in the  
manufacture of curry-comb handles, which  
require nearly all the beech grown in the  
neighborhood.





# USE THE BEST.

## NEW



THE NEW AMERICAN FILE COMPANY have the exclusive right to use the Bernot process for cutting Files. By this method all the advantages of hand cutting are secured, together with an accuracy unattainable in hand work. They are the only manufacturers who employ machinery for testing Files and Steel.

**NEW AMERICAN FILE CO., Pawtucket, R. I.**

### AUBURN FILE WORKS,

Superior Hand-Cut

## FILES AND RASPS,

MADE FROM IMPORTED STEEL. EVERY FILE WARRANTED.

**FULLER BROS., Sole Agents,**  
89 Chambers and 71 Reade Streets, N. Y.

### Bolt and Rivet Clippers,

For cutting off the ends of bolts and rivets, on carriages, wagons, harness, &c.

SEND FOR A CIRCULAR AND PRICE LIST.



Liberal discount to the trade.

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PHILADELPHIA.

**VOLUME IV**  
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**The Horse Tinsmith**  
PUBLISHED MONTHLY BY  
**TIFF & HOWARD,**  
12 NASSAU ST. & 15 PARK PLACE.  
Will contain more than 60 pages of  
ORIGINAL MATTER,  
More than 60 pages of  
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FINE ILLUSTRATIONS,  
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In all, more than  
THREE HUNDRED PAGES  
Of special interest to  
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NEW LONDON, CONN.,  
MANUFACTURERS OF

### SOLID BOX VISES,

Composition and Steel Roller Bushings, Fishing Swivels, Coffee Mills, Jack Screws, Turning Lathes, Clamp Heads and Screws  
Parallel Bench Vises, Bench Screws, Vise Screws, Box Chisels, Rivets, Sheaves, Block Pins, Riggers' Screws, Callers' Tools, Tackle Blocks and

**GENERAL HARDWARE.**  
OFFICE & WORKS, New London, Conn.

## MICA.

Miners of and Dealers in MICA of all Sizes.

MICA TO ORDER IN ANY PATTERN.

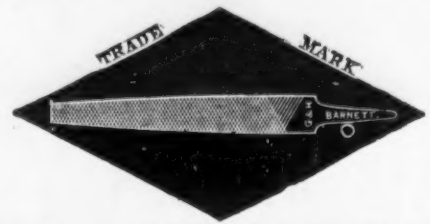
As we own extensive mines at Chester, Mass., and also in North Carolina, Stone Manufacturers and Hardware Jobbers are invited to communicate with us before contracting elsewhere.

**THE CHESTER MICA & PORCELAIN CO.,**

OFFICE, 87 Liberty Street, New York.



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Awarded by Jurors of Centennial Exposition, 1876, for  
"VERY SUPERIOR GOODS."

**G. & H. BARNETT,**

39, 41 & 43 Richmond St., Philadelphia.

ESTABLISHED IN 1816.

NO CONNECTION WITH ANY OTHER HOUSE.

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No. 95 Fulton Street, New York.

AGENTS for the American Screw Co.'s Machine Screws and Taps.

SOLE AGENTS Thos. Turner & Co.'s, Files, Horse Rasps.

"Hubert's French Emery Paper.

IMPORTERS OF STUBS' Files, Tools, Steel Wire.

"GROBET'S Fine Swiss Finishing Files.

"VAUTIER, NICOD and RENARD Gravers.

"JEWELERS' and Machinists' Supplies.

DEALERS IN Scroll Saw Machines, Bracket Saws, Wood and Patterns.

### CHARLES B. PAUL,

Manufacturer of HAND CUT FILES.

Warranted CAST STEEL.

All descriptions of Files made to order. Price List mailed on application.

Established 1863.

Quality Unsurpassed.

Every File Warranted.

### THRIFT FILE WORKS.

To the Hardware Trade.—  
GENTS: We desire to call your attention to our brand of HAND-CUT FILES. The files we offer are of equal quality, and made by the same process as those manufactured by Stubs, Butcher, Spencers and others, of Sheffield, England, and we shall so continue to manufacture them until we become satisfied that the American Market demands an inferior File at a lower price, which can only be produced by



the introduction of machinery for cutting, which, to this time, we have not thought advisable to introduce in our works, as our files have been tested by the largest and most experienced consumers, who have decided the great superiority of HAND-CUT over Machine-Cut Files, and advise us to continue the original process of CUTTING BY HAND as the only method of producing a first-class and strictly reliable article.

**R. H. HOWARD & CO., Nos. 428 & 430 Ireland St., Phila.**

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POLISHED OR BLUED.

HAMMERED AND FINISHED



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Are Hammered Hot,

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Quality is **Fully Guaranteed.**

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### Stove Pipe Elbows.

The Hogen Elbow has no CRIMPS, CAVITIES or ANGLES, which cause accumulations that rust or corrode the iron; it is also easily polished and kept clean, its surface being smooth and regular on all sides. The Hogen Elbow forms the arc of a circle, and invariably holds the pipe securely at right angles, without the use of rivets.

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Best Cast Steel.  
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Every File warranted.

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We invite the attention of the trade to our Celebrated American Horse Rasps & Files, made from the very best American Steel, all cut by hand, and warranted to give entire satisfaction. All Rasps & Files not stamped as the annexed incorporated trade mark are not genuine. Sold by Hardware Dealers generally.

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**FLOWER POT BRACKETS,**  
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AGENCY FOR  
**S. H. & E. Y. Moore,** Anti-Friction Barn Door Hangers, &c.

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Send for prices and specialties.

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This Drawer has sixteen compartments. For efficiency, durability and convenience it is provided with superior locking mechanism, that any one using a common drawer can attach our common lock—when set, a combination lock—and is also an alarm lock.

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For Boring PUMP LOGS. All sizes in stock. Socket-shanks, Ring Handles, and Connecting Rods for the above to order. Also Tensioning Tools for joining log ends. Coopers' and Millers' Tools. Tool Chests—Tools for all trades a specialty.

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For Upholsterers' Use, Saddlers' Supply, Card, Clothing, etc., etc.

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Any variations from the regular size or shape of the above-named goods made from sample to order.

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Award and Medal for Self-Coiling Steel  
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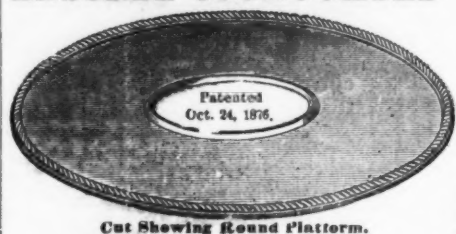
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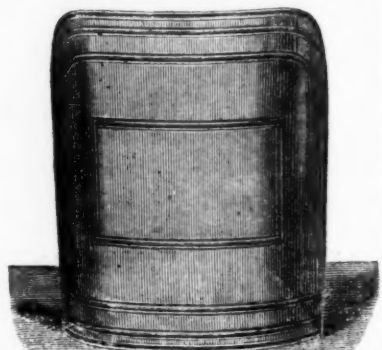
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The Portable Bronzed Fire Screen or  
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We desire to call special attention to our New JOINER'S POCKET BLOCK  
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Medals Awarded: Paris Exposition, 1867; Vienna Exposition, 1873; Philadelphia, 1876.

Illustrated Catalogue sent per mail on application.

### The Iron and Coal Trades.

The London Saturday Review says: For a long series of years such intense depression has not prevailed in the iron trade as is experienced at the present moment. From every district where that trade is carried on the reports are to the same effect, though the different branches of the industry are not equally affected. Indeed it appears to be not a mere depression but an actual revolution, which the trade is undergoing. The production of the raw material is seemingly being transferred from its old seats to centers economically more favored, and the manufacture is passing through a transformation, on their ability to adapt themselves promptly to the exigencies of which depends the future prosperity of our ironmasters. The depression is felt far more severely in the finished than in the crude trade. The demand for pig iron has undoubtedly fallen off, and the output has been considerably diminished, but not at all to the extent of the decrease in the manufactured article. In Scotland the number of furnaces now in blast is 32 fewer than the average of the past 30 years—a remarkable evidence of adversity, in spite of the fact that the blast furnace of the present day is of enormous capacity compared with that of a quarter of a century ago. Again, we find that the output of pig iron last year decreased by 121,000 tons. And as in Scotland, so also in Lancashire and Staffordshire, in Derbyshire, Lincolnshire and South Yorkshire, there has been a falling off. On the other hand, however, there has been a considerable increase in the Cleveland district. During the first nine months of the past year the increase was marked, and although there is an estimated decline in the last quarter for the whole year the augmentation is supposed to be not less than 40,000 or 50,000 tons. The increase here, it will be seen, is not at all equal to the decrease elsewhere; nevertheless it is a significant fact. Cleveland exported to Scotland no less than 333,000 tons of pig iron in the twelve months, and its competition was also keenly felt in the other districts. Along with the diminution of demand there would appear, therefore, to be in operation a transfer of the pig-iron trade to the Cleveland district from districts economically less favorably situated. Its advantages are such that it seems to be gradually driving its competitors out of the market. If this were all the result would be finally beneficial. As in all great changes of the kind, there would be deplorable suffering on the part of the workpeople engaged elsewhere, and there would be a great waste of the capital that gives them employment before it could be reinvested more profitably, but in the long run the country would obtain its iron more cheaply. Unfortunately, however, this is not a full statement of the facts. The Cleveland district is exporting largely to the Continent, and especially to Germany, as well as to the home districts, and it is the crude metal which it is sending abroad. Continental manufacturers have at last learnt that they can buy pig iron at Middlesbrough and carry it home more economically than they can obtain it at their own doors; and cheap and docile labor, with skillful and thrifty management, enable them in many cases to re-export it to England when manufactured, and to undersell our own makers. Thus we are not only parting with the reserve wealth of the country, but we are losing the profits and wages earned in working it up by ironmasters, coalowners and workpeople. Unless, therefore, employers and trade unionists alike awaken to the danger with which they are menaced, England appears to be slowly losing her pre-eminence as the great iron manufacturer of the world, which only a few years ago seemed assured to her, and to be sinking down to the position of a mere producer of the raw material—a material, too, be it remembered, which can never be replaced when once exported, and which is the indispensable instrument of all modern industry.

It is, however, in the finished trade that the real severity of the depression is felt. India and Australia have taken a larger quantity of railway iron than in the preceding year; and Russia has kept up her demand; but the United States, lately our principal customer, have almost ceased to buy from us, and other countries have diminished their purchases. In fact, as we remarked above, we have, for the moment at any rate, lost our old manufacturing pre-eminence. In consequence mills have been closed all over the country, or have been working short time, and stocks have been accumulating at the pit mouths. Even in the favored Cleveland district the quantity of finished work turned out has decreased. Elsewhere the reduction is immense. The condition of the industry in Staffordshire is strikingly shown in the address delivered by Colonel Thorneycroft, on the Saturday before Christmas Day, to his workmen at Wolverhampton. The Colonel was a member of one of the greatest firms in the trade, and they had found themselves compelled to dispose of their business. In his parting address Colonel Thorneycroft stated that the works, which had been carried on for more than half a century, could no longer be kept going at a profit. The fault was largely attributable to the workpeople, who had refused to submit to the reduction of wages necessary to enable their employers to hold on, and the result was a stoppage of the works and also of the collieries attached. Other employers had adopted the same course, and, "so heavy was the cost of pumping the water (out of the closed mines), that owners were driven to stop their pumps, and South Staffordshire was being steadily drowned out." Respecting the state of the industry in South Yorkshire, some startling statistics have been compiled by Messrs. Pawson & Brailsford, of Sheffield. From these it appears that of 59 local companies established between 1856 and 1876, and having an aggregate capital of £7,542,000, the market value of the shares is now only £6,009,000—a depreciation of 20 per cent. below par, while a very few years ago the shares of most of them were considerably above par. In the list are several companies whose capital has increased in value nearly a million sterling; the remainder are coal and iron companies, and among these the depreciation had reached two millions and a

half. This depreciation, startling though it be, is fully accounted for when the fact is noted that the price of steel is now only one-third of what it was in 1873, and that the fall in the value of pig iron has been in the same proportion.

When the iron industry is thus prostrate, the condition of the coal trade cannot be prosperous. The production of coal is now so immense that its price is mainly regulated by the demands of the iron manufacture. Accordingly, as we have seen in the case of South Staffordshire, coal mines in many parts of the country can no longer be kept open. Prices have been steadily falling, as in the case of iron, since the summer of 1873, but the consumption, far from being stimulated, has continued to decrease, until it no longer pays to work the mines. Accordingly we find severe distress among the colliers. When nothing has occurred to waste their savings, the mining population are able to draw upon the capital put by in more prosperous times, and consequently have not become chargeable on the rates. But when the colliers have exhausted their funds in contests with their employers, they are experiencing real hardship. In South Wales, for example, there was a very protracted and extensive strike two years ago. The workpeople consequently had no board to fall back upon when adversity had overtaken the trade which gave them employment; and as the Welsh coal is chiefly in demand for the iron manufacture, coal mining there has come almost to a standstill. The colliers of South Wales are therefore suffering. At Cardiff the workhouse, we are told, is crowded; and, although a contradiction has been given to the statement that a stone-yard had been opened, it appears to be beyond doubt that the cost of relief is assuming serious proportions. At Merthyr soup kitchens have been set up, and in other places meetings have been called to afford aid. In short, it is affirmed that such extensive distress did not exist at the worst period of the late strike. In the Rhondda Valley, the most productive coal field in all Wales, we are told that the collieries are kept open only a couple of days a week, since every ton sold at present prices involves an actual loss of sixpence or ninepence. At the Cardiff Docks there are said to be miles of laden coal wagons for which there is no sale. For the past nine months the export of coal has fallen off one-third at Cardiff, and there has been a simultaneous decrease at Swansea and Newport. In the Forest of Dean also the scarcity of employment is so serious that road-making and other public works have been set on foot. And in Staffordshire the facts cited above sufficiently show what the condition of the working classes must be. In his speech at Wolverhampton, Col. Thorneycroft stated that, to provide the workpeople about to be discharged with a Christmas dinner, he had sent some iron into town to be sold for whatever it would fetch, though the loss was considerable. Lastly, we may mention that in Northumberland a great strike is maintained at this moment, in resistance to a demand of the employers for a reduction of 12 1/2 per cent. in wages. Thus the earnings of the colliers are very often insufficient to maintain their families; and where, as in South Wales, they have no savings to draw upon, they are suffering distress. It is said, indeed, that at a great number of collieries the weekly earnings per man do not exceed 5/ or 6/.

The primary cause of this lamentable collapse of two vast industries is the sudden paralysis with which railway enterprise was smitten in the summer of 1873. For the past half-century the civilized world has been busily providing itself with steam communication. We have made 16,000 miles of line, the United States four times as much, and other countries in proportion to their means and their requirements. At the same time, iron has to a large extent taken the place of wood in shipbuilding, and has also become the main instrument of all modern industry. The necessary consequence of so unparalleled a demand was an extraordinary stimulus to the production of iron. Every country, however thinly populated and however backward in development, eagerly sought to share in a trade so profitable. The iron manufacture, therefore, was fostered by every conceivable means. At length the more advanced nations had practically completed their railway network, but the warning was not taken. The less advanced countries obtained loans in the London market, and continued to work more recklessly than before. The end, however, could not long be postponed, and, with the discredit of foreign loans, railway construction was brought to a standstill. The payment of the French indemnity, which in effect was the transfer of an immense capital from productive to unproductive employment, and its reckless expenditure by the German government aggravated the crisis. The inflated prices of 1871-3 suddenly dropped, and depression fell upon the iron and coal trades. For a while the changes in naval construction made necessary by the opening of the Suez Canal mitigated the crisis by keeping up a considerable demand for iron for shipbuilding purposes. But the transformation is now nearly effected, and the apprehensions excited by the state of Europe have introduced a new element of disturbance. Lastly, the substitution of steel rails for iron has completed the disorganization of the iron industry. The works had been fitted up to manufacture iron, and before they can be adapted to turn out steel, they must be completely transformed. Happily, there is evidence that our ironmasters are alive to the necessities of the situation, and are resolutely preparing for the requisite sacrifice of capital. This country, being foremost in the iron industry, has been the first to feel the effects of the revolution it is undergoing, just as she first felt the revolution in naval construction. If she acts as promptly as on that occasion, she will have no need to fear the result. For good or for evil, iron must give place to steel, not only in rails, but also in shipbuilding, and, indeed, wherever lightness and strength combined are required. If, then, we can beat others in the manufacture of steel, we shall retain our pre-eminence. To that end the endeavors of those interested should principally be directed. The prevailing depression will pass away; but whether this country will finally share in



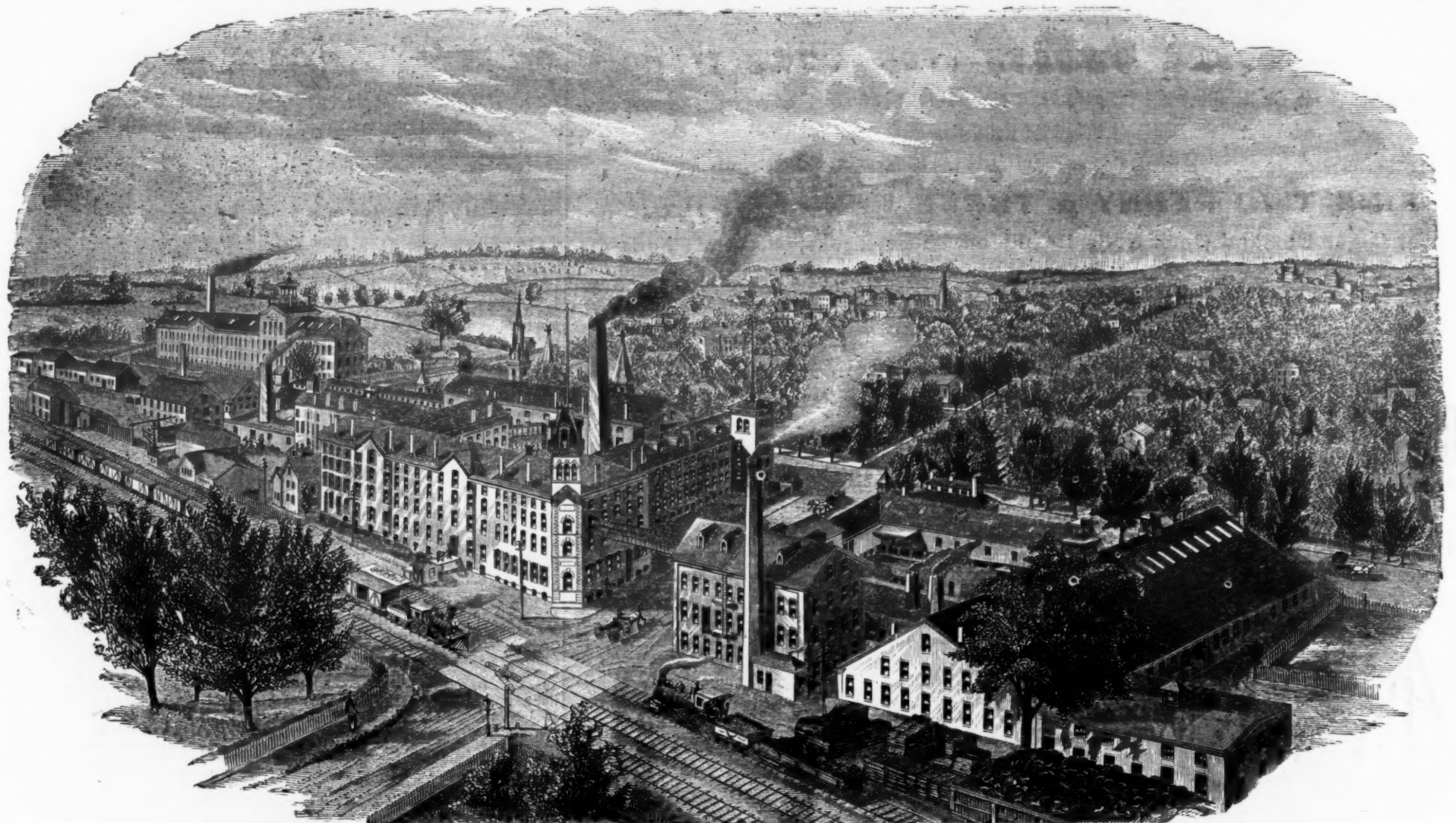
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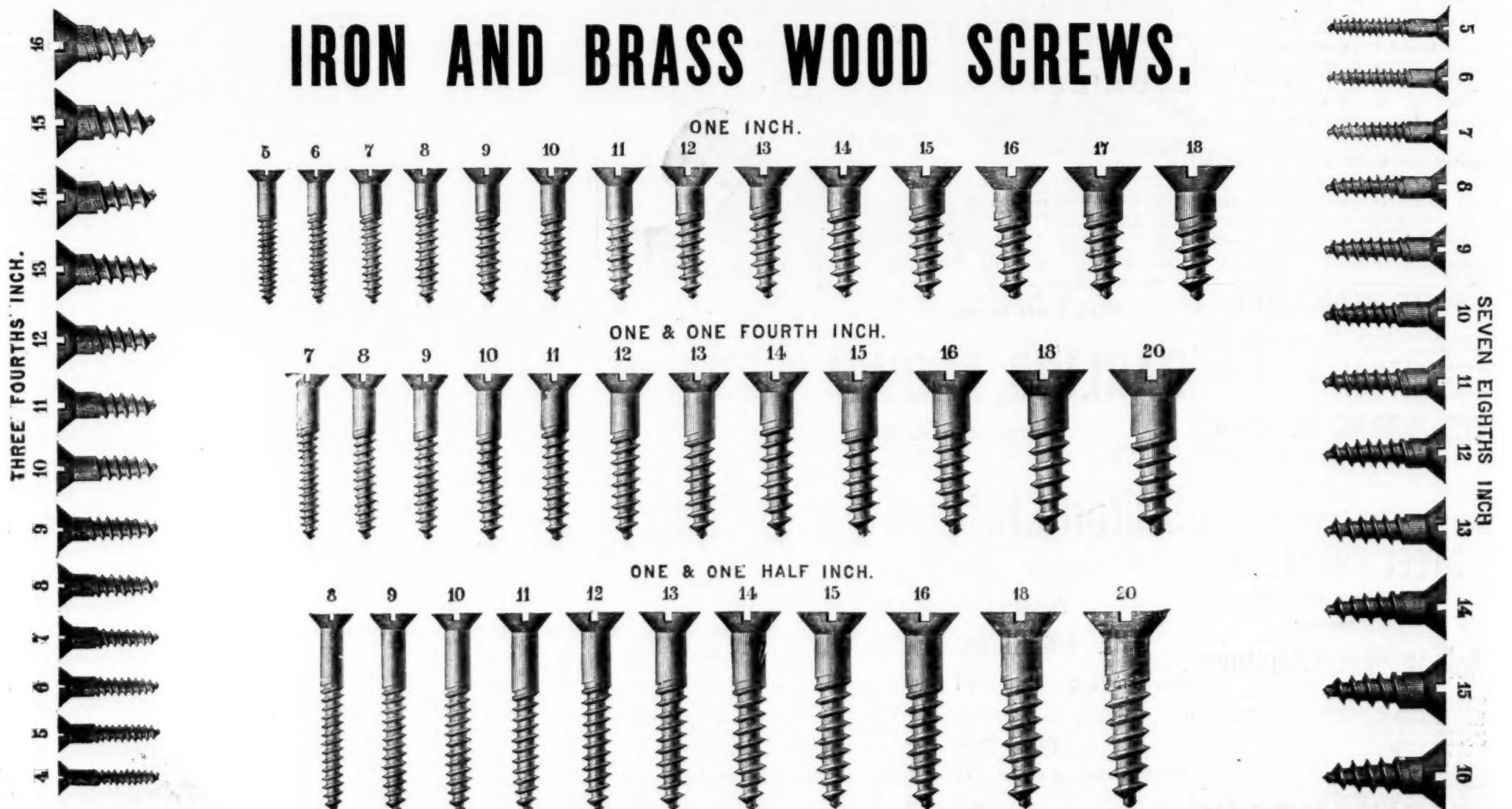
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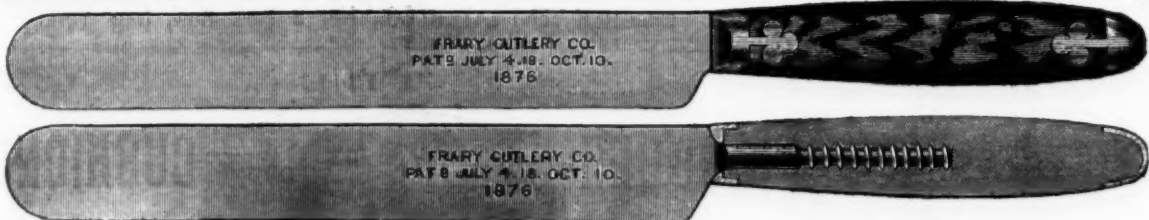
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The above illustrations represent their New Patent Screw Tang Lock Fast Solid Handle Knife.

There is no question but that a solid handle knife is much more preferable than a scale tang. The great objection to their use hitherto is, that no solid wood handle has been placed on the market with the handle properly secured—no handle put on with cement will stand the wear and tear of every day usage. The cement will expand and contract with the action of heat and cold, and become loose, crack and come off, causing great prejudice against their use. This objection is overcome in our patent screw tang. A wood screw is welded to the tang of the knife or fork, and screwed firmly and securely in the handle and locked there by the bolster, making a very strong neat and handsome knife, which we warrant never to get loose, crack or come off. We manufacture a large variety of patterns, both Table, Butcher and Carvers, and furnish the patent handle nearly as low as the scale tang. We are prepared to furnish this line of goods, together with the scale tang and iron handle, very promptly, and very respectfully invite the attention of the trade.

**SILVER PLATED SOLID STEEL  
HANDLE KNIVES.**

We guarantee 12 dwts. of fine silver on each dozen of Table or  
Medium Knives. All our Spoons, Forks, &c., made of 12 percent  
Nickel Silver. We warrant our extra plate

On Tea Spoons	5 1/4 ounces per gross.
" Dessert Spoons	3 3/4 " "
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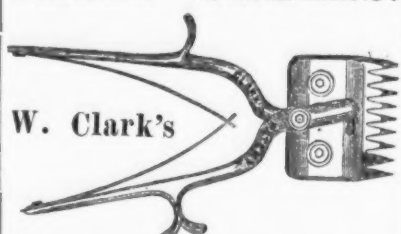
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Simple in action. Fleece evenly shorn without  
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No. 1 for two hands; No. 2, one hand, for heads  
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Send for price list.

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TOOLS.**

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My Blades are forged by hand from the best Cast Steel, and warrant-  
ed. To me was awarded the Gold Medal of the Conn. State Agricultural Society.

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**Young's Patent Folding Scissors.**

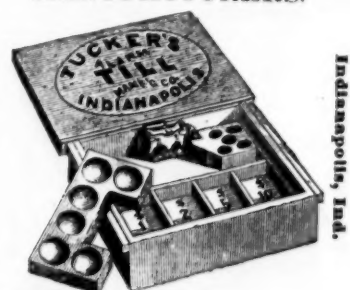


Pat. May 28-72.

These Scissors are made of the very best steel, nickel  
plated, and so constructed that they can be readily  
folded and carried in the pocket without injury to the  
contents. A sample pair will be sent by mail, to the  
trade only, upon receipt of the retail price, namely:  
For small size, either blunt or pointed.....\$1.00  
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**PATENT MINERAL WOOL.**

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water pipes, hydrant and street washer boxes,  
refrigerators, cold storage houses, &c. Cheap  
enough for deafening walls of dwellings, factories,  
&c. State rights for sale. Send for circular to

**ALEXANDER D. ELMERS,**

No. 28 1/2 Broadway, N. Y., P. O. Box 4461.

the new prosperity depends upon whether  
we make intelligent use of the period of  
suspense through which we are passing. To  
these general causes of depression must un-  
doubtedly be added the suicidal folly of the  
workpeople in refusing to aid their em-  
ployers to tide over the period of difficulty  
and bad trade. Instead of submitting to the  
necessary reduction of wages, they com-  
pleted the disorganization of industry by  
strikes all over the country. When we  
say that the past year witnessed 101 labor  
conflicts, it will be evident how ruinous must  
have been the disarrangement of business,  
how extensive the driving away of custom,  
and how serious the waste of capital.

The Cuban Trade.

NASHVILLE, Tennessee, February 1.—The  
Cuba delegation returned to this city last  
night. The sub-committee to investigate  
the flour and meal trade of Havana re-  
port to Colonel John C. Burch, chair-  
man of the General Committee, that the  
great barrier to trade between Cuba and the  
United States is the discriminations in duties  
and war taxes, American flour being a spe-  
cial object of discrimination. The duty and  
war tax on American flour, in American  
vessels, is \$6.88, as against \$2.81 for Spanish  
flour in Spanish vessels, the whole tendency  
being in favor of Spanish importation and  
against the United States. By this discrim-  
ination, only one-tenth of the flour im-  
ported to Cuba comes from the United  
States. If the duties were equalized the  
United States would probably furnish the  
bulk of the consumption, thus increasing the  
demand on the United States to \$1,500,000  
for the article of flour alone. A close exam-  
ination of the records shows an enormous dif-  
ference between the small exports of the  
United States to Cuba and the amount we  
receive from that island. Of the exporta-  
tion of sugar and molasses from Cuba, the  
United States gets 90 per cent., Europe 8  
per cent. and Spain 2 per cent. The com-  
mittee found Havana merchants eager to  
extend American trade.

Traffic with Brazil.—Colonel W. B. Tis-  
del, who has returned recently from a tour  
in South America, whither he went nearly  
a year ago to study the mercantile interests  
of Brazil and other countries, gives the fol-  
lowing statement of his experience, as show-  
ing an opportunity to secure a profitable  
business for the United States: Brazil seems  
to be open to us if we will only grasp at the  
opportunity, and if we could divert a por-  
tion of its enormous trade to our shores it  
would open to our people new sources of  
trade. We should be enabled to compete  
successfully with European manufacturers,  
for a portion, at least, of the trade of this  
great and growing country. The commerce  
of Brazil is monopolized and controlled by  
Europeans, notwithstanding the United  
States is her principal patron, and is abun-  
dantly able to supply her with nearly every-  
thing she requires and at cheap rates. I  
found nine regularly established steamship  
lines, which make semi-monthly trips,  
assisted by long postal contracts for the  
transportation of the mails between Europe  
and Brazil, and that the steamships so em-  
ployed are large and powerful, first class in  
every respect, and with an average tonnage  
above 3000. The imports of Brazil, from  
1871 to 1876, were valued at £471,570,-  
589.50; the exports at \$577,041,492. During  
the same period, the imports to the United  
States from Brazil amounted to \$274,148,-  
500, while the exports from the United  
States to Brazil amounted to only \$48,853,-  
555. Instead of paying for the same in  
products of our own, we are compelled to  
send our gold coin to Europe in payment for  
Brazilian produce, and with that gold the  
supplies for Brazil are there purchased.  
I found a strong desire on the part of the  
merchants and business men of Brazil for an  
extension of trade with the United States,  
and I also found a most friendly feeling ex-  
isting toward the people of our country,  
partly because of the cordial reception and  
kind attention given their emperor and  
empress during their travels in the United  
States.

The Trade Dollars.—Postmaster James  
has received the following dispatch sustain-  
ing him in refusing the trade dollar for post-  
age:

POST OFFICE DEPARTMENT,  
OFFICE THIRD ASSISTANT POSTMASTER GENERAL,  
WASHINGTON, D. C., Jan. 31, 1878.  
Hon. T. L. James, Postmaster, New York  
City: SIR.—The following telegram has just  
been sent you in reply to yours of this date:  
"Trade dollars not being a legal tender, you  
are not obliged to receive them." A joint  
resolution of the Senate and House, approved  
July 22, 1876 (see Stats., vol. 19, res. 17, sec.  
2, p. 215), is the authority upon which the  
above decision is based. Very respectfully,  
A. D. HAZEN,

Third Assistant Postmaster General.

M. Thenard makes bold to doubt the com-  
monly accepted medical theory that there is  
ozone in the air. Its presence in our atmos-  
phere is determined, he says, by the change  
in the depth of color of prepared paper;  
but, after all, it is not known that there are  
no other substances in air which can affect  
the paper in the same way. By passing a  
current of air through a gas blast, Wittman  
obtained air which acted on prepared paper  
as ozonized air does; while, however, this  
air disinfected putrid water without render-  
ing it acid, ozone, so it is stated, did not dis-  
infect it, but turned it acid. Moreover, it is  
known that ozone cannot exist above 200  
degrees, and yet the air modified by Witt-  
man's method had been exposed to the tem-  
perature at which glass softens. Although  
he is not prepared to deny the possible pres-  
ence of ozone in the atmosphere, M. Thenard  
holds it rash to regard as proved what is  
still vague and uncertain, and perhaps dan-  
gerous. These views of M. Thenard have  
led to considerable discussion, alike from  
their novelty and importance.

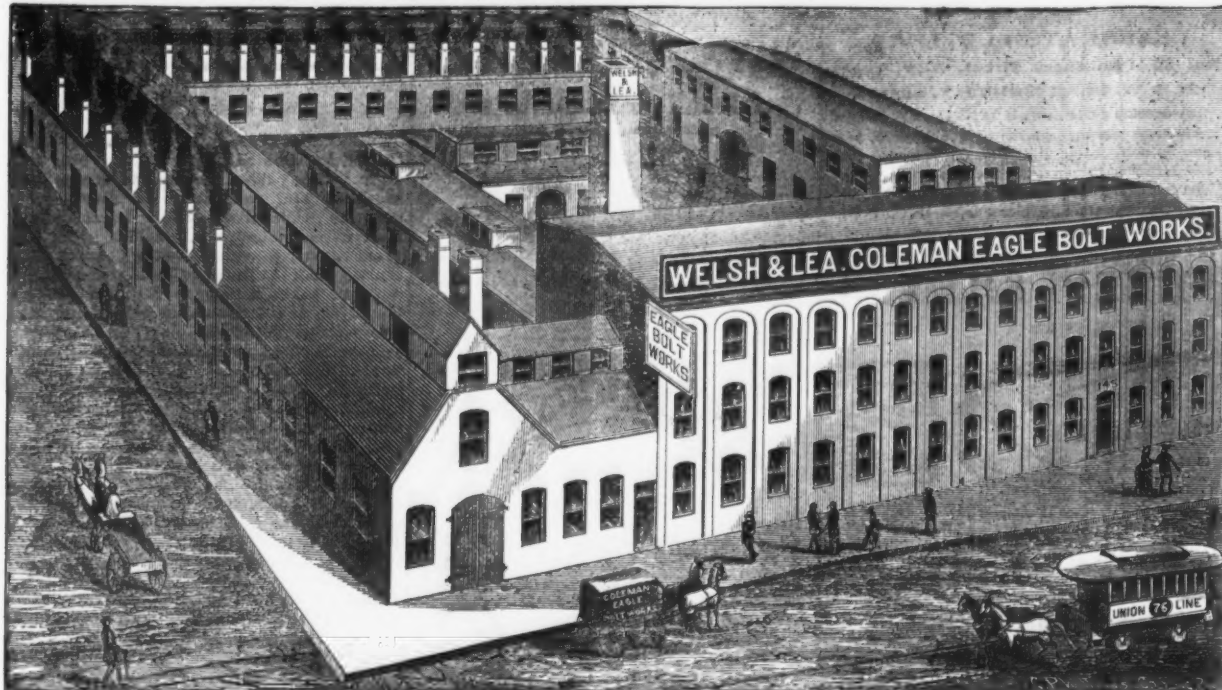
In Chicago, during January, 42 individ-  
uals and firms took advantage of the bank-  
rupt law. The entire amount of liabilities  
shown by this procedure was \$1,341,785.86.  
Besides this amount there were \$810,196.31  
of secured debts, making a total of \$2,151,982.17.



# COLEMAN EAGLE BOLT WORKS

ESTABLISHED 1845.

## WELSH & LEA.



### NORWAY IRON CARRIAGE & TIRE BOLTS, AXLE CLIPS, &c.

WORKS, Columbia Avenue, Hancock and Mascher Streets.

OFFICE, 145 Columbia Avenue (late 2030 Arch St.),  
PHILADELPHIA.

## CLARK BROTHERS & CO.,

SOLE MANUFACTURERS OF

### Clark's Patent Concave Carriage Bolt.

Best Bolt manufactured for all kinds of Agricultural Machinery. Will not split the wood, and cannot turn in its place.

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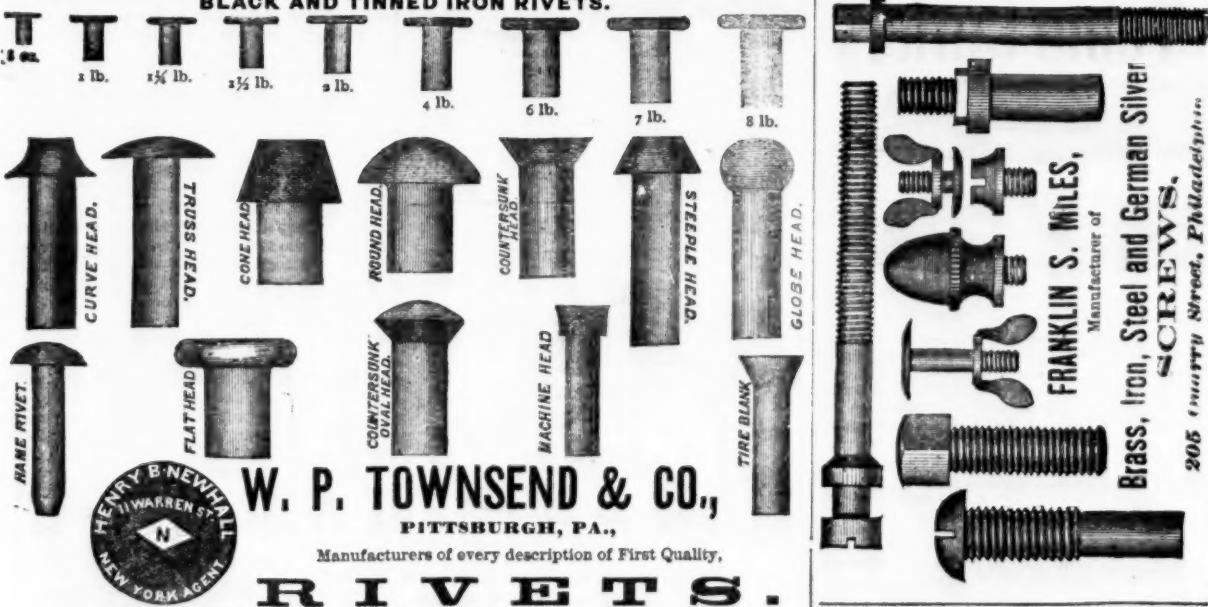
MILDALE, CONN.

## HOLROYD & CO.,

Waterford, N. Y.



BLACK AND TINNED IRON RIVETS.


**W. P. TOWNSEND & CO.,**  
PITTSBURGH, PA.,  
Manufacturers of every description of First Quality,

### RIVETS.


**Lyons & Fellows Mfg. Co.,**  
Cor. 1st and North 3d Streets, Williamsburgh, N. Y.

**R. COOK & SONS,**  
Manufacturers of

**Carriage & Wagon AXLES,**

WINSTED, CONN.

ESTABLISHED 1839.

## Philadelphia "STAR" Bolt Works.

NORWAY IRON

FANCY HEAD BOLTS,

Carriage &amp; Tire Bolts.

Star Axle Clips, &amp;c.

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## HOOPE & TOWNSEND,

PHILADELPHIA, PA.,

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Tank and Coopers'

COLD PUNCHED

RIVETS,

Square and Hexagon

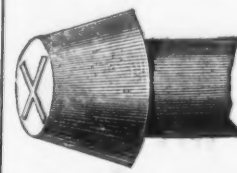
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WOOD SCREWS,

**"Keystone" Boiler Rivets,**

Unequaled in Quality and Finish.



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Boiler Rivets, Bolts, Railroad and Boat  
Spikes, &c.

BALTIMORE.



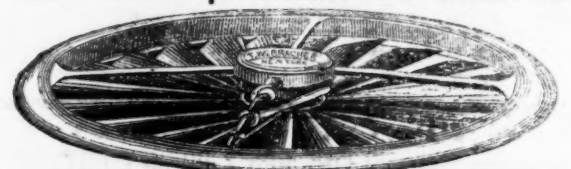
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FOR FALL TRADE.

All dealers in SPRINGS AND AXLES will find it to their interest to send us for  
Price List and Discounts. WOOD, SMITH & CO., Fort Plain, N. Y.

Steam and Frost prevented on Show Windows.



## REVOLVING VENTILATORS

For everything (and every size), from a hat or cap to an exhibition building.

Kitchens, Laundries, &amp;c., ventilated without draft. Durable, strong, without rivets or solder. Oiled for six months. Each one has storm cap. Retail price, size six inch diameter, \$1.00 and upwards; apparatus with which any one can cut circles in glass, 15 cents each.

Protective Ventilators avoid drafts, exclude dust, dampness, malaria and germs of disease; adopted by hospitals, schools, institutions, &amp;c.; applied to any window or room.

Prof. A. L. Loomis, M. D., University of City of New York, writes as follows:

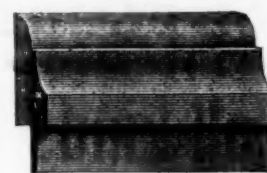
"From my personal experience and that of my patients who have used your Ventilator during the past six months, I am convinced that your method of removing dust, impurities and dampness from the atmosphere is the best which has as yet been proposed. By it the air in an apartment can be constantly changed without causing drafts. I would especially recommend its adoption in sick rooms, sleeping apartments, nurseries and school rooms."

Air Filters and Moisteners, placed over hot-air registers of furnaces, &amp;c., prevent dust and supply steam filtered air. Prices and discounts to the trade sent on application.

The "Economy" Molding Weather Strip is perfect in every respect. By enlarging edge of rubber or felt, and making slot in molding to correspond (see engraving), we save all other expense of molding. Once purchased it will last a lifetime, because rubber, etc., has only to be removed by taking old piece out of either end of molding, and sliding in a new piece. By this method of securing rubber all uncertainty of fastening or undoing of glue or tacks is overcome.

Rubber supplied with enlarged edge and instructions to enable Car Manufacturers, Carpenters, Builders and far off trade to make slots in Sashes, Doors, Molding, &amp;c., and thus make perfect Weather Strips.

No. 6.



BRACHER VENTILATOR CO., No. 3 Park Row, New York.



## THE RUBBER-CUSHIONED AXLE

Assures in its Use

**SAFETY, COMFORT and ECONOMY.**

Vibration, Jolting, Pounding and Noise largely decreased, reducing Wear and Tear to a minimum. Approved and endorsed wherever used. Correspondence solicited.

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Broadway and 43d Street, (Long Acre), - - - NEW YORK.

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John St., Bridgeport Conn., Manufacturers of

**THE VERY BEST SPRINGS AND AXLES.**

Our Standard Springs, weighing about half as much as the Springs of other makers, to do the same work cost but little more per vehicle than a common Spring. Our Jamb-screw, Collings Collar, Parallel Arm, Malleable Iron Box Axles are the best in the world. Exclusive makers of

**LEWIS' TORSION AND CROSS SPRINGS.**

Supercedes the Brewster Cross and End, dispenses with side spars, weigh less, hangbody equally low, ride easier and cost less. Shop actively stocked with new and improved machinery. Send for Price List W. H. WILSON Pres. and Treas. O. P. LEWIS (formerly of Spring Porch Co.), Secy. and Supt. J.



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## Plantville, Conn.,

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## BEST QUALITY CARRIAGE MAKERS' HARDWARE.

Manufacture the Largest Variety of Forged Carriage Irons of Best Material and Workmanship.

PRICES LOW FOR QUALITY OF WORK FURNISHED.

SEND FOR PRICE LIST.

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## Pennsylvania File Works, Philadelphia.

Awarded for



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Trade Mark.



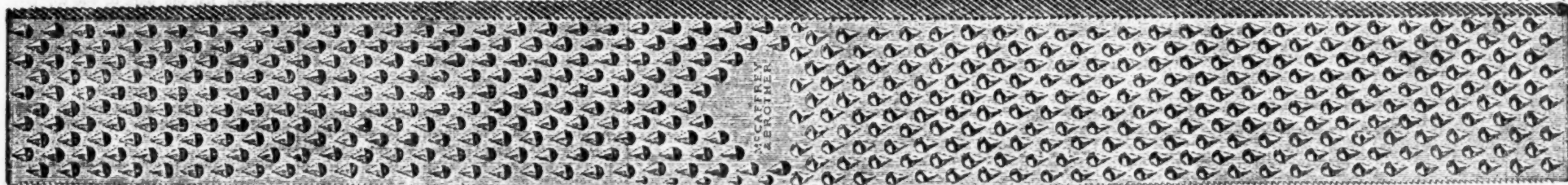
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Being practical mechanics, engaged exclusively in making **FILES AND RASPS** of all descriptions, and having specialties in our line, we are desirous of receiving a share of public patronage. When tested with other brands at present in the market, our Files and Rasps have never failed to do more work. Foreign orders receive prompt attention.



Double Horse Rasp

N. S. ARNOLD &amp; CO., 310 California Street, San Francisco. Sole Agents for the Pacific Coast.



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The most complete assortment in the U. S. of Shank, Socket Firmer and Socket Framing Chisels.

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Gauges of all lengths and circles, beveled inside or outside. Nail sets, Scratch and Belt Awns, Chisel Handles of all kinds. Orders filled promptly; generally same day as received.

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MANUFACTURERS OF

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OF ALL KINDS,

### Screw Hooks and Strap and T Hinges,

Etc., Etc



Send for lithographs and price lists.

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## CARRIAGE HARDWARE

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Tubular Bow Sockets.

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Butchers' Cleavers,  
 Butchers' Choppers,  
 Axes and Hatchets,  
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 Tilt Picks,  
 Box Chisels and Scrapers

Ring Bush Hooks,  
 Axe Eye Bush Hooks,  
 Socket Bush Hooks,  
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 BEST BRANDS SOLD.  
 X BULLION, A  
 \$9.50 per doz.  
 E LIPPINCOTT'S, X  
 \$9 per doz.  
 S DIAMOND, E  
 \$8 per doz. Cash, 50 days.  
 A X E S

Made in Pittsburgh by  
 HUBBARD, BAKEWELL & CO.  
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Everyone who keeps good Hardware.

PATENT CONVEX  
 Fluting & Smoothing Iron.



1st. It can be used as an ordinary Smoothing iron. 2d. It is a Fluting Machine as well as a Smoothing Iron. 3d. The Fluting Attachment being made of brass, and convex in form, it has all the advantages of the crank machine. 4th. It combines the two articles in one, taking up the room of but one machine, and is always ready for use.

A. A. WEEKS, Manufacturer,  
 No. 82 John Street New York.



# The Iron Age.

New York, Thursday, February 7, 1878.

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JAMES C. BAYLES, Editor.  
JOHN S. KING, Business Manager.

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JOS. D. WEEKS, Manager and Associate Editor.

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### BRITISH AGENCY.

The publishers of *The Ironmonger*, 44 Cannon Street, London, England, will receive orders for subscriptions and advertisements on our regular terms.

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The American Hardware Company, Melbourne, are our agents for Australia. Sample copies will be mailed by them, free of charge, to any firm engaged in the trades we represent in Australia, Tasmania and New Zealand.

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**Thirty-second Page.**—Philadelphia, Buffalo, Chicago and Pittsburgh Hardware and Metal Prices.  
**Thirty-third Page.**—Boston and St. Louis Hardware and Metal Prices.

A bill has been introduced into the Ohio Legislature which provides that all those in debt who carry on a legitimate business, and who by the present depression of business have become embarrassed, are to be made free of execution—that is, their personal or real estate is, during the year, to be sold compulsorily neither by the sheriff nor constable. The Cincinnati *Enquirer* lately published an article advocating a law suspending all collection laws for three to five years. The Chicago *Tribune* prints a communication advocating the repudiation of the national debt, and practically endorses it as follows: "The writer simply gives utterance to sentiments that are harbored in the breasts of multitudes of men who have not yet reached the point of openly avowing them or acting upon them. The cure for this alarming sort of feeling is to change the financial policy of the gov-

ernment and arrest contraction of the money value of commodities and real estate, stop the falling market that is killing all business men and manufacturers, and thereby remove the desperation which men driven to the wall feel." All of which is very deplorable.

### Let us Protest to Some Purpose.

The manufacturers and working men of the United States owe it to themselves and to the whole American people to make Mr. Wood and his associates of the Ways and Means Committee feel that they are not the rulers but the servants of the nation, and that as "representatives" they have betrayed their trusts and merited the reprimand due to unfaithful servants. Mr. Wood and his collaborators, in framing the absurd tariff bill elsewhere discussed in some detail, have invited the storm of indignation which their work has raised. Ignorant of the requirements and conditions of the great industries to be affected by tariff legislation, they have assumed a wisdom born of the conceit of ignorance, and slamming the door of their committee room in the faces of manufacturers and merchants, have essayed the task of revising the tariff in a manner much like that in which a bull might be expected to rearrange the wares on the shelves of a china shop. Delegations and committees representing great interests and duly accredited, have presented themselves at Washington and been informed that the sub-committee had neither time nor inclination to hear arguments from representatives of special industries. We might infer from this that they had time to listen to the generalities of theorists who represented nothing but their own ideas; but however this may be, the productive industries of the country were shamefully snubbed, and the work of the committee went on in supreme disregard of the fact that vast material interests were at stake. For this reason, if for no other, the representatives of the capital and labor of the country owe it to themselves to say that this product of conceited and self-sufficient ignorance shall be strangled at its birth, and that Congress shall be made to understand that the making of a new tariff is not a work to be done hastily nor in a corner by men unfitted for the task.

We are glad that this view is taken by a majority of our manufacturers. Fortunately the proposed tariff pleases no one but the men who made it. Those who favor free trade are amazed and disappointed; those who favor moderate protection with cheap raw materials, are astonished to find an average increase in the duties on raw material and an average reduction on manufactures; those who favor protection as a principle and believe it should be extended to include all departments of domestic production, are alarmed and disgusted. A few restless spirits—men without convictions and favorable to anything in the way of a change—may be pleased, but there are not many even of these who will not find themselves, directly or indirectly, unfavorably affected by some one of its numerous provisions, and whose aid cannot be enlisted in securing its defeat. There is, therefore, abundant material out of which to organize an opposition which must cause even the present Congress to give heed to the voice of reason and the counsel of experience. A beginning has already been made, but only a beginning. The following notice comes to us from Philadelphia:

Office of  
THE AMERICAN IRON AND STEEL ASSOCIATION,  
No. 265 South Fourth Street,  
Philadelphia, Feb. 2, 1878.  
All manufacturers of Pig Iron, Bar Iron, Iron and Steel Rails, and all other forms of Iron and Steel, are requested to meet at the rooms of the American Iron and Steel Association, in Philadelphia, at 10 o'clock on Tuesday, February 12th, 1878, to formally protest to Congress against the passage of the proposed Tariff Bill now under consideration in the Ways and Means Committee, and to concert measures to secure its defeat if reported to the House. A full attendance of members of the Association is earnestly requested. SAMUEL J. REEVES, President.  
JAMES M. SWANK, Secretary.

Other interests are moving in the same direction, and the united opposition thus organized will probably be formidable. But it is not sufficient nor proportionate to the gravity of the issue. Mass meetings should be held, petitions circulated and signed and individual action taken. And here let us say that no one who feels enough interest in the defeat of the Wood bill to work for it, should stop with attending meetings or signing his name to protests and petitions. Members of Congress should be made to feel that their constituents are fully awake to the gravity of the questions shortly to be brought to their consideration. A mass meeting may make a loud noise locally, but it will not echo through the corridors of the National Capitol unless supplemented by the personal work of those interested. In the words of a gentleman lately prominent in national politics, "this must not be a still hunt."

Why do we counsel such action? Because we believe that the defeat of the misshapen and premature offspring of the Ways and Means Committee is essential to the welfare and prosperity of the country. We are not prepared to say that the present tariff could not be changed and modified in some respects with advantage. It is by no means a perfect system, and at the proper time it might be changed for the better in many respects. But this is not the proper time. In perilous days like these the business of the

country should not be required to readjust itself to a new and arbitrary basis. To require this would be to force thousands into bankruptcy, to unsettle values and to destroy what little confidence is now felt in investments. We owe our present depression in no small degree to causes for which the Government is responsible. Last year recovery, when already begun, was checked and new-born hopes disappointed by the prolonged excitement of the national canvass. Perhaps this could not have been prevented nor more satisfactorily terminated than it was, but it certainly paralyzed trade and postponed recovery. This year Congress is to blame for needlessly making bad matters a great deal worse. The silver agitation, with all its uncertainties and unfortunate possibilities, has had the natural and inevitable effect of prolonging and even increasing the depression in industry and trade, and now comes the menace of surprising changes in the tariff at a time when no change, however desirable in the abstract, could safely be made. We want rest and a chance to recuperate.

Granting for argument sake, if necessary, that the largest possibilities of future progress lie in the direction of practical free trade (which would be conceding more than the facts would warrant), we cannot now make any radical change in the tariff without serious resulting evils. All that our industries need, so far as Congress is concerned, is to be let alone. In such an emergency even those who doubt the advantages of protection to home industry must see that this is no time to increase the duties on raw materials and decrease the duties on manufactures. Too many great manufacturing industries are now tottering, and we shall gain nothing from ruthlessly giving a *coup de grace* under the misnomer of tariff reform.

In estimating the effect of such a tariff as that proposed, we must consider, not the specific effect upon this industry or that, but its influence upon the whole trade of the country. Can anyone question for a moment that the immediate effect of the adoption of this tariff would be widespread mischief and confusion? Can anyone intelligently doubt that in consequence of its failures would multiply, values fluctuate, credit totter and labor suffer? If so, can anyone with the welfare of the country at heart, and with material interests, even to the labor of his hands, at stake, refuse co-operation in the work of defeating this foolish bill, and rebuking the presumption which seeks to remodel the tariff without allowing the accredited representatives of those to whom it is a matter of vital moment the poor privilege of setting forth facts for the consideration of the sub-committee?

### The Marvelous Tariff Bill of the Sub-Committee.

The Sub-Committee of Committee on Ways and Means have reported to the full committee, and their bill is now before the country for criticism. It is understood to be the work of Mr. Wood, and we are not disposed to doubt that eminent statesman's part in the framing of the document. Protests innumerable are hurrying to Washington against it. How Mr. Wood arrived at a decision as to which articles should have a reduced tariff, which should retain the present rates and which be placed on the free list is a mystery. He certainly has not consulted the opinion of those most interested. He has not heard the views of the manufacturers of the articles affected, and it is very questionable if Mr. Wood's knowledge of the details of these businesses and their needs is sufficiently extensive to enable him to decide unaided the question he has disposed of with so much confidence. He probably evolved the bill as it stands from his inner consciousness. It is intuitive knowledge that gives us the proposed tariff of 1878.

The opposition to the proposed bill promises to be very decided and to unite in a general effort to prevent its passage elements hitherto somewhat antagonistic. Mr. James M. Swank telegraphs "that the American Iron and Steel Association earnestly disapproves of Mr. Wood's tariff bill, and will use all its influence to secure the defeat of the measure. Other manufacturing interests are also moving against it." A mass convention is to assemble in Pittsburgh on the 9th inst., to take formal action against the bill, and all over the country there will be such an outcry against it as will compel the attention of Congress.

The most determined opposition to the bill, especially from the workingmen, will be excited by the third section. This provides that merchandise of foreign growth or production may be entered in bond for manufacture in bonded warehouses, at the port of original importation or elsewhere in the United States, into articles composed wholly of foreign merchandise, or of which such foreign merchandise shall be the component of chief value, to be exported from the port of original importation without paying of duty or internal revenue tax within one year from the date of entry. If the bonded manufacturing warehouse is situated at a point or place other than that of original importation, the merchandise shall, after due entry and appraisement, be transported in bond to such other port or place, and the articles manufactured therefrom returned in bond to the port of importation for export; and every such bonded manufacturing warehouse shall be in charge of one or more storekeepers, who shall hold their appointment from the chief customs officer at the nearest port, and the amount of whose

salaries shall be collected monthly by such chief officer from the owner or lessee of the warehouse, and the proof of the cancellation of the bonds given on the exportation of such manufactured articles, shall consist of the oaths of the master and mate of the exporting vessel and the certificate of the consular officer of the United States at the port where the articles are landed, that such articles have been landed at such foreign port. The necessary regulation for carrying the provisions of this section into effect shall be prescribed by the Secretary of the Treasury.

This is certainly a very queer proposition. It invites the establishment of foreign workshops on our territory, to avail themselves of all our advantages and then to enter into competition with our own goods, manufactured in some cases from imported stock on which the duty has been paid or which has been somewhat enhanced in value by a protective tariff. It is virtually fencing off a little piece of ground and making it foreign territory. The feeling of the workingmen of this country is being very strongly stirred on this point, and we shall be much mistaken if it does not cause one of the most severe tariff contests this country has ever seen.

In the duties on iron and steel some very sweeping and radical changes have been made. Pig iron has been reduced from \$7 per ton to \$5—an entirely gratuitous and unnecessary reduction, as but little iron is brought to this country except what comes as ballast. That will come any way, and might as well pay \$7 as \$5. Common sheet iron has been reduced on the average 50 percent, while common bar remains as before, carrying out the very idea we have so frequently suggested, that the reductions of tariff would be made on the higher grades of iron, importers having given up the market for the common iron. But the worst feature of the bill in its reductions on iron, is in polished sheet iron and scrap. The former has been reduced from three cents per pound to one cent—a reduction which promises to destroy utterly the new industry of planished sheet in this country. Smooth or polished sheet includes not only planished but cold rolled, &c. This is and must be made from a very high grade of iron equal to Norway, which is worth \$85 per ton. On this the duty is 35 percent, or about \$28, but on the sheet iron, which is made from this, with all the labor required added to it, the duty is only \$20 per ton, or one cent per pound.

The scrap-iron duty is reduced from \$8 to \$1 per ton on wrought iron—a bid to the whole world to send their scrap iron to this country. Bar iron can be made from scrap at a reduction of 50 percent in the amount of labor required if the same is made from ore and pig. In this provision will also be found the loophole for the entrance of a whole brood of frauds, and it is not assuming too much to say that there will be no hesitation on the part of importers of a certain class to take advantage of the opportunities thus offered.

The more we look into the details of Mr. Wood's sweeping bill, the more we are unable to discover the theory of the changes which are proposed. Let us look at the rates proposed on iron. The change from \$7 to \$5 per ton on pig is not a measure of revenue. It would not increase importations, nor would it benefit manufacturing industries consuming iron. The change in scrap iron from \$6 for cast and \$8 for wrought to \$1 for all kinds is certainly a sharp reduction; but why tax pig iron \$5 per ton and let in cast scrap at \$1 per ton? The difference would pay for converting pig into cast scrap and leave handsome profit, inasmuch as cast scrap includes all kinds of broken castings which may or may not have been made originally for some useful purpose. There would probably be some risk attending so irregular an operation at this port, but elsewhere appraisers are more liberal, and it would not be difficult to get a great deal of iron into the country as scrap which had never been used as a material in the arts elsewhere.

When we come to the proposed duty on steels we find anomalies equally confusing. Steel rails are reduced from 1 1/4 to 1 cent per pound. This we can understand; but let us look a little further. The bill provides that steel of various grades shall be taxed as follows:

Involved at	Present.	Proposed.
2 1/2 in. 10 in. ....	2 1/2 cts.—\$20.40	\$20.66
2 1/2 in. 12 in. ....	2 1/2 cts.—\$20.40	\$11.10
2 1/2 in. 14 in. ....	2 1/2 cts.—\$20.40	\$11.10
Wire rods to No. 5 gauge.	30 cts.	35 cts.

Thus we see that in low grade steels it is reduced, while on the higher grades the rate is sharply increased. This is simply inexplicable. An increase in the rates of duty on fine steel would be better than an equal reduction, but we doubt if the steel makers want increased protection just now, or that they will view the proposed changes without alarm. Considering the vigorous efforts which have been made in times past to secure a material reduction of the duty on steels of all grades, an increased protection to steel makers could only have the effect of strengthening the opposition which is now gradually dying out, and no good purpose would be served thereby. In saying this we believe we express not only our own opinion, but the views of steel makers in general. The only favor they ask at the hands of Congress is to be let alone.

Turning to the clauses relating to metals other than iron and steel, we first note those relating to copper. As the items are given elsewhere we need only speak generally of their probable effect, which would be une-

qual. There would be a largely increased importation of ores from Chili, and to some extent from the Cape and Australia; also of pyrites from Spain. The smelting works at Baltimore and elsewhere on the Atlantic coast would be largely benefited; the manufacture of copper and brass all along the seaboard would be stimulated, and there would probably be a larger exportation. This is intelligible, but we fail to understand the reason for the new discrimination between ingots graded according to their relative fineness. Instead of simplifying the assessment and collection of duties on copper imports, this would seriously complicate matters, confuse the appraisers and encourage attempts to evade the law. The representatives of the mining industry in the Lake Superior district and elsewhere in the United States have, we are warranted in believing, long been prepared to accept without protest a reduction of about one-half from present rates of duty, and they would not have been disappointed nor surprised at the recommendation of a plain duty of two cents on ingot copper; but a reduction of the duty on ores to one-quarter cent per pound, gross, instead of five cents on copper in the ore, as at present, they will regard as giving the smelting works an undue advantage. If this recommendation were adopted, it is believed that only a few of the very best American mines could continue working at a profit. With a duty of 1/4 c. on ores, instead of 1/2 c. as proposed, we doubt if there would be much opposition from any source to the other changes proposed.

As regards tin, Mr. Wood's tariff provides as follows: Tin in plates or sheets, terne and taggers tin, 1 cent per pound; in bars, pigs or blocks, and grain tin, 10 percent ad valorem; tin plates galvanized or coated with any metal by electric batteries, 1 1/2 c. per pound; tin plates galvanized or coated with any metal otherwise than by electric battery, 2 cents per pound. Under the present tariff, block tin is on the free list, while tin plates pay a duty of 1 to 100 percent.

The result of these changes would be to destroy at least one industry which has been successfully established here—the manufacture of tin plates. In this, however, we see the true free-trade idea—tax tin all it will bear because we do not and cannot produce it, but let in plates as cheap as possible because we have found it possible to make them.

It will be noticed that nothing is said in Mr. Wood's bill about modifying the 10 percent duty now levied on goods produced beyond the Cape of Good Hope but imported from countries less distant. Should this discriminating duty be removed, our principal dealings in block tin would thenceforward be between London and New York, both in Straits and Australian, and the trade in Banca and Billiton tin between Holland and the United States would also become quite active. The 10 percent was originally designed to protect our Indian, but the bulk of the tin from the East now arrives in English steamers via the Suez Canal, and the 10 percent duty has, therefore, lost much of its practical significance. The remaining changes are of little importance. For purposes of revenue the duty on tin plates might safely have been raised a trifle without curtailing consumption.

With regard to lead, the new bill provides as follows: Lead ore, 1 1/2 cent per pound; lead in sheets, pipes or shot, 2 1/2 cents per pound; lead in pigs and bars and old scrap lead fit only to be manufactured, 2 cents per pound. The present lead duty is 2 cents per pound in pigs; old lead, 1 1/2 cent, and manufactures of lead, such as pipe and sheet, 2 1/2 cents per pound.

Considering the liberality with which the sub-committee have taken care of the copper smelters, we are not surprised at the loud complaints which reach us from the Eastern lead smelters. The production of pure lead and base bullion is now so great that, notwithstanding a protective duty of 20 c. per lb., lead has declined from 6 1/2 c. to 3 1/2 c. If, therefore, the sub-committee had recommended a reduction of the duty to 10 c. per lb., there would have been less complaint than is now heard; while it might have secured some revenue on the finer qualities of lead for corroding purposes.

In Mr. Wood's tariff spelter and zinc in blocks or pigs are to pay 1 1/2 c. per lb.; in sheets, 2 1/2 c. The present duty is 1/2 c. on blocks and pigs, and 2 1/2 c. on sheets. The duty on spelter, which is of no particular interest to anyone, is to remain unchanged, and under existing circumstances mills which roll sheet zinc are not likely to be benefited by the slight advance proposed on sheets, nor will it increase the government revenues.

Quicksilver, now on the free list, is to pay a duty of 15 percent. This is a matter of no consequence, inasmuch as we need import no quicksilver, having a large surplus of our own production for export. So far as regards the revenues likely to accrue to the government, it would have made no difference whether quicksilver had been left on the free list or taxed \$100 per ounce.

Antimony, crude and regulus, is to pay a duty of 1/4 cent instead of the present 10 percent ad valorem. At the ruling value of antimony abroad this new duty would be a slight reduction. Manufactures, articles, vessels and wares not otherwise provided for, of brass, iron, lead, pewter and tin, or other metal (except gold, silver, platinum, cop-



per and steel), or of which either of these metals shall be the component part of chief value, 35 per cent. ad valorem. Metals unmanufactured, not otherwise provided for, 20 per cent. ad valorem.

The general provisions affecting metals are as follows: Section 2 provides for the addition of 5 per cent. to the market value of goods in lieu of what are technically known as charges and commissions. These consist of cost of transportation, packing, &c., commissions from place of production, of all articles imported into the United States. This change tends to equalize the dutiable value of different importations of similar goods, prevents fraud on the part of importers in understanding the actual amount of expenses which they have incurred, and also tends to relieve the customs officers and merchants from much annoyance and dispute as to the proper amount of costs to be charged, thus avoiding litigation and doubt, and aiding in the speedy liquidation of entries. This provision will be welcome both to the government and the general public.

There are many other features of this remarkable bill which we should be glad to discuss did time and space permit. We shall, however, be compelled to defer its further consideration until a more convenient opportunity.

#### The American Exhibit of Iron and Steel at Paris.

If we are correctly informed, there will not be a single exhibit of American iron or steel at the coming Paris Exposition. A great deal will go over in higher forms, as in castings of various kinds, hardware and machinery, but very little, if any, will be shown in an unwrought state. This is a matter of the keenest disappointment, as there has never yet been at any of the European exhibitions an approach to anything like a fair exhibit of our manufactures in these important lines. In his report on the Paris Exposition of 1867, Mr. Hewitt says that Class 40, in which iron and steel as products of industry were placed, contained "2395 entries, of which the far larger portion are produced in the United States of equal quality, and by processes equally economical," and yet he states, "The exhibition of the United States, however, was of so meagre a character that foreigners, judging from the lessons of the Exposition, would have come to the inevitable conclusion that the iron and steel industry of the United States is not entitled to the rank which it undoubtedly occupies in the metallic production of the world." \* \* \*

A few pieces of pig iron from Lake Superior, Wisconsin, Ohio and Alabama, and some inconsiderable specimens of wrought iron made from Lake Superior and Alabama pig, were the sole indications of an annual production of more than 1,000,000 tons of iron. The only proof of the existence of any manufacture of steel in the United States was contained in a case of very beautiful specimens contributed by Park Bros. & Co., of Pittsburgh, for which they received a silver medal. There was no evidence in the Exposition of our large and increasing product of bar iron, of rolled girders—in the manufacture of which we preceded the world—of cut nails, of which we enjoy almost a monopoly, and of the infinite variety of wrought and cast iron in the skillful production of which we are not surpassed by the most advanced nations of Europe.

At the Vienna Exposition of 1873 it was a little better. There were some exhibits of pig, blooms and finished irons, such as nails, bars, &c., but no steel.

The variety, and in some cases the superior character of our exhibits at our own Exposition, led to the entertaining of the belief that at Paris in 1878 we should have an exhibit that would not cause us to be ashamed, but we are doomed to disappointment.

There are some good reasons for this, however. The chief one is that but little business can be expected as the result of such an exhibit. The preparation, installation and care of such a display as some of our iron and steel firms made at the Centennial will involve a larger outlay, and it would only be as a contribution to enhance the honor of our country and give an adequate idea of its manufactures that it would be undertaken, and such a result could only be reached by personal effort on the part of the commissioners. It is all well enough to say, in cases where increased business may be the result, that if a firm does not feel sufficient interest to send an exhibit without personal application the loss is theirs, but in this case it is different. The exhibit of *The Iron Age* will give those interested a clear idea of the development of the iron, steel and manufacturing industries of the country, but it was not supposed that this would be all the foreign visitor would see of them. However, there is all the more reason why our library and collection of photographs and drawings should be complete, and we hope our efforts to this end will be ably seconded by all for whom the subject has interest.

The tariff demonstration at Pittsburgh on Saturday of this week promises to be the most imposing ever held in the country. In all parts of Western Pennsylvania, Eastern Ohio and West Virginia, business will be suspended for the day and extra trains will be run to Pittsburgh where all labor will be suspended and the day given up to processions, speeches &c. The most significant feature of the movement is the part the workmen are taking in it. They will turn out en masse and give such a decided tone to the meeting that we shall be mistaken if it is not heard. We shall have a full report of the meeting in our next issue.

#### The Sub-Committee's Tariff.

##### METALS.

\* Iron in pigs, \$5 [87] per ton.  
Iron ore [20 per cent. ad valorem] and scrap iron [86 per ton for cast and \$8 for wrought], \$1 per ton.

Sheet iron, common or black, not thinner than No. 20, wire gauge,  $\frac{1}{2}$  [1 $\frac{1}{4}$ ] cent per pound; thinner than No. 20 and not thinner than No. 25, wire gauge,  $\frac{3}{4}$  of 1 [1 $\frac{1}{4}$ ] cent per pound; thinner than No. 25, wire gauge, 1 [1 $\frac{1}{4}$ ] cent per pound.

Taggers iron 1 cent per pound [30 per cent. ad valorem].

Smooth or polished sheet iron, by whatever name designated, 1 [3] cent per pound.

Steel railway bars, 1 [1 $\frac{1}{4}$ ] cent per pound. Iron and steel and manufactures of iron and steel of every description not otherwise provided for, made up in whole or in part of iron or steel, or of which iron or steel is the component of chief value, 35 [35] per cent. ad valorem.

Lead ore,  $1\frac{1}{2}$  [1 $\frac{1}{2}$ ] cents per pound.

Lead in sheets, pipes or shot,  $2\frac{1}{2}$  [2 $\frac{1}{2}$ ] cents per pound.

Lead in pigs and bars [2] and old scrap lead fit only to be manufactured [1 $\frac{1}{2}$ ] 3 cents per pound.

Quicksilver, 15 [15] per cent. ad valorem.

Zinc, spelter, tuteneque in sheets  $2\frac{1}{2}$  [2 $\frac{1}{2}$ ] cents per pound.

Tin in plates or sheets,terne and tagger's tin, 1 cent per pound [15 per cent. ad valorem]; in bars, pigs or blocks and grain tin 10 [20] per cent. ad valorem.

Tin plates, galvanized or coated with any metal by electric batteries,  $1\frac{1}{2}$  [2] cents per lb.

Tin plates, galvanized or coated with any metal otherwise than by electric battery, 2 [2 $\frac{1}{2}$ ] cents per pound.

Copper in mallea or regulus and in all forms in which the copper is not advanced to the metallic state, one-fourth of 1 per cent. [3 and 4] per pound; on the fine copper contained [fine assay] any gold or silver accruing thereon to be free of duty.

Copper in pigs, bars, slabs, precipitated copper, and in all forms in which the copper is metallic of below 98 per cent. purity [fine assay], 2 cents per pound on the fine copper contained [5 cents per pound].

Refined copper of commercial purity or 98 per cent. and upward in ingots, cakes, tile bars, sheet and all forms not rolled, 3 [5] cents per pound.

On rolled copper in sheets, plates, bolts or bars and hammered copper, 5 cents [45 per cent. ad valorem] per pound, except sheathing copper.

In sheets of 48 inches long and 14 inches wide, from 13 to 34 ounces per square foot, which shall be 3 [3] cents per pound.

Yellow sheeting metal and yellow metal bolts of which the component part of chief value is copper, shall be deemed manufactures of copper, and shall pay the duty now prescribed by law for the manufactures of copper on articles manufactured of copper, or in which copper is the component of chief value, not otherwise provided for, 35 [35] per cent. ad valorem.

On old copper, fit only to remelt, 2 [4] cents per pound.

Gold leaf, \$1.50 [1.50] per package of 500 leaves, and in like proportion for any number of leaves; silver leaf 75 [75] cents per package of 500 leaves, and in like proportion for any number of leaves.

Dutch and bronze metal, in leaf, 10 [10] per cent. ad valorem.

Argentine, alabatta, or German silver, unmanufactured, 25 [35] per cent. ad valorem.

Brass in bars or pigs, and old brass, fit only to be remanufactured, 10 [15] per cent. ad valorem.

Articles not otherwise provided for, made of gold, silver, German silver or platinum, or of which either of those metals shall be a component part of chief value, 40 [40] per cent. ad valorem.

Silver-plated metal, in sheets or other form, 35 [35] per cent. ad valorem.

Manufactured articles, vessels and wares, not otherwise provided for, of brass, iron, lead, pewter and tin or other metal (except gold, silver, platinum, copper and steel), or of which either of these metals shall be the component part of chief value, 35 [35] per cent. ad valorem.

Metals unmanufactured not otherwise provided for, 20 [20] per cent. ad valorem.

Antimony, crude and regulus,  $\frac{3}{4}$  of 1 per cent. per pound [10] per cent. ad valorem.

##### GLASS, ETC.

All unpolished cylinder, enameled, crown, colored and ground window glass, not exceeding 40 inches in length and width, 1 cent per square foot [1 $\frac{1}{2}$  cent to 2 $\frac{1}{2}$  cents per pound on sizes from 10 by 15 inches square to sizes 24 by 30 inches square, and 3 cents per pound on larger sizes]; on all sizes of the above glass, exceeding 40 inches in length and width, 2 cents per square foot [3 per pound].

Cylinder and crown glass, polished, not exceeding 10 by 15 inches square, 2 [2 $\frac{1}{2}$ ] cents per square foot; above that and not exceeding 16 by 24 inches square,  $3\frac{1}{2}$  [4] per square foot; above that and not exceeding 23 by 30 inches square, 5 [6] cents per square foot; above that and not exceeding 24 by 60 inches, 15 [20] cents per square foot; all above that, 35 [40] cents per square foot.

Fluted, rolled or rough plate glass, not including crown, cylinder, or common window glass, not exceeding 10 by 15 inches square, 75 [75] per 100 square feet; above that and not exceeding 16 by 24 inches square,  $\frac{3}{4}$  [1] cent per square foot; above that and not exceeding 24 by 30 inches square, 1 [1 $\frac{1}{2}$ ] cent per square foot, and above that,  $1\frac{1}{2}$  [2] cents per square foot.

On all polished cylinder glass, silvered, an additional duty of 25 per cent. in addition to the rates above specified; and all plated, rolled, or rough plate glass weighing over 100 pounds per 100 square feet, shall pay an additional duty on the excess, at the same rates herein imposed.

Cast polished plate glass, unsilvered, not exceeding 10 by 15 inches square,  $2\frac{1}{2}$  [3] cents per square foot; above that, and not exceeding 16 by 24 inches square,  $4\frac{1}{2}$  [5] cents per square foot; above that, and not exceeding 24 by 30 inches square, 10 [8] cents per square foot; above that, and not exceeding 24 by 60 inches square, 25 [25] cents per square foot.

\* The figures in brackets show the present duty.

per square foot; all above that, 50 [50] cents per square foot.

Cast polished plate glass, silvered, or looking-glass plates, not exceeding 10 by 15 inches square, 5 [4] cents per square foot; above that, and not exceeding 16 by 24 inches square, 8 [6] cents per square foot; above that, and not exceeding 24 by 30 inches square, 15 [10] cents per square foot; above that, and not exceeding 24 by 60 inches square, 50 [35] cents per square foot; all above that, 80 [60] cents per square foot. But no looking-glass plates or plate glass, silvered, when framed, shall pay a less rate of duty than that imposed upon similar glass of like description not framed, but shall be liable to pay in addition thereto 30 [30] per cent. ad valorem upon such frames.

And all other articles of glass, or of which glass shall be the component of chief value, not otherwise provided for, 40 per cent. ad valorem, except that bottles of glass or of earthenware containing any liquid or substance which pays a duty shall be admitted free of duty.

Earthen and stone ware, china, porcelain and Parian ware, ornamented or not ornamented, of every description, composed of earthy or mineral substances, and not otherwise provided for, 40 per cent. ad valorem; earthen and stone ware, not ornamented, 25 per cent. ad valorem; china, porcelain and Parian ware, gilded, ornamented, or decorated, 50 per cent. ad valorem; not decorated, 45 per cent. ad valorem; on all other earthen, stone or crockery ware, ornamented or plain, not otherwise provided for, 40 per cent. ad valorem.

Brimstone, in rolls or refined, \$10 [10] per ton; crude, \$3 [free] per ton.

Brick, fire-brick, roofing and paving-tile, 10 [20] per cent. ad valorem.

Bristles, 15 [15] cents per pound.

Britannia ware, 20 per cent. ad valorem.

Brushes of all kinds, 30 [40] per cent. ad valorem.

Buttons and button-molds, not otherwise provided for, 30 [30] per cent. ad valorem.

Carriages, or parts of carriages, 30 [30] per cent. ad valorem.

Coal, slack and culm, such as shall pass through a half-inch screen, 40 [40] cents per ton of 28 bushels, 80 pounds to the bushel; coal, bituminous and shale, 75 [75] cents per like ton.

Composition tops for tables or other articles of furniture, 35 per cent. ad valorem.

Corks and cork bark, 30 per cent. ad valorem [free, manufactured 30 per cent.].

Cream tartar, 9 [10] cents per pound.

Fire crackers, \$1.50 per box of 40 packs [31; less than 40, 30 per cent.], not exceeding 80 to each pack, and in the same proportion for any greater or less number: fire crackers, not otherwise provided for, 35 per cent. ad valorem.

Glycerine, manufactured, of gravity over 28 $\frac{1}{2}$  degrees Beaume, 4 cents per pound; crude, brown or yellow, of the gravity of 28 $\frac{1}{2}$  Beaume, or less, 1 cent [30 per cent.] per pound.

Hair of all kinds, and manufactures composed of a mass of which hair is a component of chief value, not otherwise provided for, 30 [35] per cent. ad valorem; hogs' hair, 1 cent per pound; camels', horse, and all cattle hair, free; hair cloth, 30 per cent.; hair cloth seating, 30 and 40 cents per square yard.

Hides and skins of all kinds, not otherwise provided for, and hide cuttings, 10 [10] per cent. ad valorem.

Hops, 5 [5 $\frac{1}{2}$ ] cents per pound.

India-rubber, crude and milk of, and gutta-percha [free], 10 per cent. ad valorem; manufactures of gutta-percha, 20 [40, less 10] per cent. ad valorem; India-rubber, and articles composed wholly of, 20 [20] per cent. ad valorem; articles composed in part of India-rubber, not otherwise provided for, 15 per cent. ad valorem; India-rubber and silk, manufactures of, or manufactures of India-rubber and silk and other materials, 30 per cent. ad valorem [webbing, 35 per cent.].

Ivory [free]; mink, 35 per cent.; animal or vegetable, and manufactures of, 50 per cent. ad valorem.

Leather, band and belt leather, Spanish or other sole leather, 10 [15] per cent. ad valorem; calf-skins, tanned, or tanned and dressed, 20 [25] per cent. ad valorem; upper leather of all other kinds, and skins dressed and finished of all other kinds, not otherwise provided for, 15 [20] per cent. ad valorem; skins for Morocco, tanned, but unfinished, 5 [10] per cent. ad valorem; manufactures and articles of leather, or of which leather shall be a component part of chief value, not otherwise provided for, 30 [35] per cent. ad valorem; leather and skins, jappaned, patent, or enameled, 30 [35] per cent. ad valorem.

Linseed or Flaxseed, 15 [20] cents per bushel of 56 pounds weight.

Malt, 35 [20 per cent.] cents per bushel of 34 pounds.

Marble—White, statuary, brocatelle, sienna, and verd antique, in block, rough or squared, \$1 [1 and 25 per cent.], per cubic foot; veined marble and marble of all other descriptions not otherwise provided for, in block, rough, or squared, 70 cents [50 cents and 20 per cent.], per cubic foot; sawed, dressed, or polished marble, marble slates, and marble paving tiles, 30 per cent. ad valorem [25 cents per square foot, and 30 per cent.]. If more than 2 inches in thickness, 35 [35.45 and 55 cents per square foot, and 30 per cent.] per cent. ad valorem, such marble shall be subject to the duties imposed upon blocks. All other manufactures of marble not otherwise provided for, 75 [50] per cent. ad valorem, and marble blocks may, in the discretion of the Secretary of the Treasury, be bonded in open yards, under the care of an officer of customs, at the expense of the owner or importer.

Mats of cocoanuts, 30 [25] per cent. ad valorem. Matting, China and other floor matting, and mats made of jute or grass, 30 [30] per cent. ad valorem.

Music, printed with lines, bound or unbound, 20 [20] per cent. ad valorem.

Muskets, rifles and other firearms, 30 [35] per cent. ad valorem.

Rags and waste fit only for the manufacture of paper, grass pulp and other paper material, not otherwise provided for, 10 [free] per cent. ad valorem.

Rattans and reeds, manufactured or par-

## PARIS EXPOSITION.

### Library of American Books on Hardware, Mechanics and Metallurgy.

The interest excited in the minds of intelligent Europeans in the Mining, Metallurgical and Metal Manufacturing Industries of the United States by the reports of experts who visited our Centennial Exposition, as well as by the increasing volume of our exports of manufactured goods, will render the American Department of the Paris Exposition an object of much interest to intelligent foreigners. There are, however, many reasons why we shall be unable to make such a showing as will do us full justice, or satisfy the reasonable expectation of visitors interested in the metallurgical and manufacturing progress of this country. The tardiness of Congress in accepting the invitation of the French Government discouraged early efforts to prepare for the Exhibition; and now the shortness of the time before the opening, and the limited space allowed the United States, make it certain that, while many interesting specimens of ores, metals and their manufactures will probably be shown, the collection cannot be so complete as to possess much value for the visitor who wishes to study the progress and present state of these industries in this country.

To supplement this necessarily incomplete showing of products, the publisher of *The Iron Age* will exhibit a LIBRARY OF AMERICAN BOOKS of interest and value relating to mining, the treatment and reduction of ores; the manufacture of Iron, Steel and other metals of commerce; the processes by which these metals are worked into useful forms; the nature, excellence and variety of American goods composed wholly or in part of metal; and price lists showing their cost, from which comparisons may be made with similar products of other countries.

The library will consist of the following departments:

#### I.—GEOLOGY AND MINERALOGY.

Reports of Geological Surveys of States and Territories.

Reports of Surveys of Private Tracts and Sections of Country developed by Railroads.

Maps and Charts showing the Mineral Wealth of different sections of the United States.

American Metallurgical Text Books and Works of Reference.

Standard American Works on Mining, Assaying, &c.

We shall be under obligations to any one who may assist us in making this collection complete, as it will undoubtedly possess great practical interest and value, and attract much attention to the vast and varied mineral resources of the United States.

#### II.—METALLURGY.

Standard American Works relating to the Metallurgy of Iron, Steel, Gold, Silver, Copper, Lead, Zinc, &c.

Drawings, Plans, Photographs or other Illustrations of American Metallurgical Establishments, Processes and Plant.

Papers on Metallurgical Subjects read before Scientific Societies or published in pamphlet form.

It is our intention that this department shall embrace everything of value which can be procured. Metallurgists and metallurgical chemists who have privately printed suitable papers will confer a favor by sending us copies without delay, that they may be properly classified and catalogued.

#### III.—MECHANICS AND METAL WORKING.

Standard American Works on Steam and Railroad Engineering, Machine Building, Tools, Implements, &c.

Catalogues and Price Lists of American Engine Builders, Machine Tool Makers, &c.

Photographs, Drawings and other Illustrations of American Machines.

Standard American Works relating to Processes in the Manufacture of Metal Goods of all kinds.

Photographs, Drawings or other Illustrations of American Factories of Metal Goods.

In making this department complete, we shall need the generous assistance of every manufacturer of metal wares.

#### IV.—HARDWARE, AGRICULTURAL IMPLEMENTS, STOVES AND MANUFACTURES OF METALS IN GENERAL.

Catalogues and Price Lists of American Hardware.

Catalogues and Price Lists of American Agricultural Implements.

Catalogues and Price Lists of American Stoves, Furnaces and Heating Apparatus.

Catalogues and Price Lists of other American Metal Wares.

This collection of catalogues and price lists will be one of the most interesting features of the whole exhibit; and in the present state of feeling abroad in regard to American products, will be sure to attract great attention from all persons interested in metal goods. All manufacturers are earnestly requested to send at once copies of all their price lists, catalogues, circulars, &c. We would be pleased to have this department include every printed document in the trade.

Beside the items above specified, we shall accept anything suitable for exhibition in connection with books and illustrations; but our space will not permit us to show samples of ores, metals or manufactured articles.

We desire it to be understood that no charge will be made under any form or pretext for exhibiting any book or other document, or for any services, the object being to present a collection of books, &c., which shall show the position of the United States in the metal producing and manufacturing branches of industry and attract the attention and excite the interest of foreigners.

The exhibit will be under the personal supervision of Mr. David Williams, publisher of *The Iron Age*, *The Metal Worker*, *The Metallurgical Review* and who intends to remain in Paris during the entire term of the Exposition—May 1 to Oct. 31—to direct the execution of a plan for the extensive circulation of these periodicals through all the countries represented in the Exhibition, especially those with which we have commercial relations of increasing importance. He will be assisted by competent persons speaking different languages, who will afford foreigners every opportunity of informing themselves as to the state of the metal working industries in America.

Letters and other mail matter for American visitors may be sent to our care, and every facility and convenience will be afforded those who may wish to make our exhibit their headquarters.

To avoid any misunderstanding, we would state that we cannot undertake the distribution of any printed matter, nor advance in any special way the interests of particular concerns. The exhibit is intended to represent impartially the whole trade, and no individual interests can be allowed to interfere with this object.

Persons having books, catalogues, drawings, photographs, maps or other illustrations suitable for classification in this exhibit, are requested to send them without further invitation, owing to the shortness of the time remaining for completing the work of collection and classification. Address

DAVID WILLIAMS, Publisher, 83 Reade Street, New York.



tially manufactured, 25 [25] per cent. ad valorem.

Saltpeter, crude, refined or partially refined, 2 cents per pound.

Type—Plain book and newspaper, 15 cents [25 per cent.] per pound. Type—Jobbing and ornamental, 30 cents [25 per cent.] per pound.

Paints and dyes—Aniline dyes and colors by whatever name known, 50 per cent. ad valorem [50 cents and 35 per cent.]. Lead, white or red, litharge, dry or ground in oil, 3 [3] cents per pound. Ultramarine, 6 [6] cents per pound. All other paints or painter's colors, oil or water, and dyes, not herein otherwise provided for, 20 [25] per cent. ad valorem.

Manufactures, articles and wares of, 50 [35] per cent. ad valorem.

Pencils of wood filled with lead or other material, 50 [50 cents and 30 per cent.] cents per gross. Lead pencils, not in wood \$1 [81] per gross.

Plated and gilt ware of all kinds, 50 per cent. ad valorem.

Percussion caps 40 [40] per cent. ad valorem.

Philosophical apparatus and instruments, 40 [free] per cent. ad valorem.

Polishing powders of all descriptions, [25 per cent.]. Frankfort black and Berlin, Chinese, fig and wash blue, 25 per cent. ad valorem.

Potash, bichromate of, 4 [3] cents per pound; chlorate and chromate of, 3 [3] cents per pound; hydriodate, iodate and iodide of, 75 [75] cents per pound; acetate of, 25 [25] cents per pound; prussiate of, yellow, 5 [5] cents per pound; prussiate of, red, 10 [10] cents per pound; bicarbonate of saleratus and potash, 1 1/2 [1 1/2] cent per pound.

Soda, caustic and bicarbonate of, 1 1/2 [1 1/2] cent per pound.

Soda, ash [1/2 cent per pound] and carbonate [1/2 cent per pound] of, under whatever name designated, 20 per cent. ad valorem.

Oil, olive, \$1 [25 cents] per gallon; linseed or flaxseed, 15 [30] cents per gallon, 7 1/2 pounds of weight to be estimated as a gallon.

Sponges 20 [20] per cent. ad valorem.

Sulphur, flowers of, \$20 [20 and 15 per cent.] per ton.

Toys and dolls, wooden or otherwise, for children, 50 per cent. ad valorem.

Twine or pack thread, not otherwise provided for, 35 per cent. ad valorem.

Umbrella and parasol ribs and stretchers, frames, sticks, tips, runners, handles, or other parts thereof, finished or unfinished, 30 [45] per cent. ad valorem.

Umbrellas, parasols and sunshades when covered with silk or alpaca, and all other umbrellas not otherwise provided for, 40 [60; all other 45] per cent. ad valorem.

Varnish valued at \$1.50 or less per gallon, 40 cents [50 cents and 20 per cent.] per gallon; valued at above \$1.50 per gallon, 50 cents [50 cents and 25 per cent.] per gallon.

Vitriol, white, or sulphide of zinc, 20 [20] per cent. ad valorem; blue, or sulphate of copper, 2 [4] cents per pound.

Watches, watch cases, watch movements, parts of watches, and watch materials, 25 [25] per cent. ad valorem.

Clocks and parts thereof [35 per cent.]. Chronometers—box or ship—and parts thereof, 25 [10 per cent., less 10 per cent.] per cent. ad valorem. Enamel white, for manufacturing white faces, 10 per cent. ad valorem.

Goat skins, raw, 20 per cent. ad valorem.

Gum shellac, 5 cents per pound.

Gum Arabic, Jeddo, Senegal, Barbary, East India, Cape Australia, gum Benzoin or Benjamin, gum copal, Sandarac, Dammar, Gamboge, Cowrie, Mastic Tragacath, Olibanum, Guine, Myrrh, Bdellium, Garbanum, and all gums not otherwise provided for, 10 per cent. [about 20 per cent.] ad valorem.

Indigo and abstract of indigo, 10 per cent. ad valorem.

Macaroni and vermicelli, 3 cents per pound.

Brazil or cream nuts, 3 cents per pound.

Mother of pearl, 20 per cent. ad valorem.

Pulp of wood, \$20 per ton.

Plumbago, 20 [20] per cent. ad valorem.

Steam, gas and water tubes and flues of wrought iron, 3 1/2 cents per pound.

Tortoise, or other shell, manufactured, 20 per cent. ad valorem.

Verdigris or sub-acetate of copper, 10 per cent. ad valorem.

Works of art—Paintings, statuary, fountains, and all other works of art not otherwise provided for, 10 per cent. ad valorem [10 per cent.; if by American artists, free].

OTHER REGULATIONS.

Section 2. In determining the dutiable value when an ad valorem rate of duty is imposed upon any imported merchandise there shall be added to the cost, or to the actual wholesale price or general market value at the time of exportation in the principal markets of the country from whence the same has been imported into the United States, 5 per cent., in lieu of the costs of transportation, shipment and transshipment from the place of growth, production or manufacture, whether by land or water to the vessel in which shipment is made to the United States; and also in lieu of the commission, brokerage and export duty, and all other actual or usual charges made for sack, box or covering of any kind in which such merchandise is contained, and for putting up, packing and transportation for shipment; and the 5 per cent. so charged shall be distributed pro rata among all parts of such invoice, and every part thereof charged with duties based on value shall be advanced according to its proportion. [In general this section accords a reduction.]

MANUFACTURING IN BOND.

Section 3. Merchandise of foreign growth or production may be entered in bond for manufacture in bonded warehouses at the port of original importation, or elsewhere, in the United States into articles composed wholly of foreign merchandise, or of which such foreign merchandise shall be the component of chief value, to be exported from the port of original importation without payment of duty or Internal Revenue tax within one year from the date of entry. If the bonded manufacturing warehouse is situated at a point or place other than that of original importation, the merchandise shall, after due entry and appraisement, be transported in bond to

# AMERICAN SCREW CO.,

Providence, R. I.

Manufacturers of

## IMPROVED Gimlet Pointed Wood Screws, Patented

May 30,

1876.

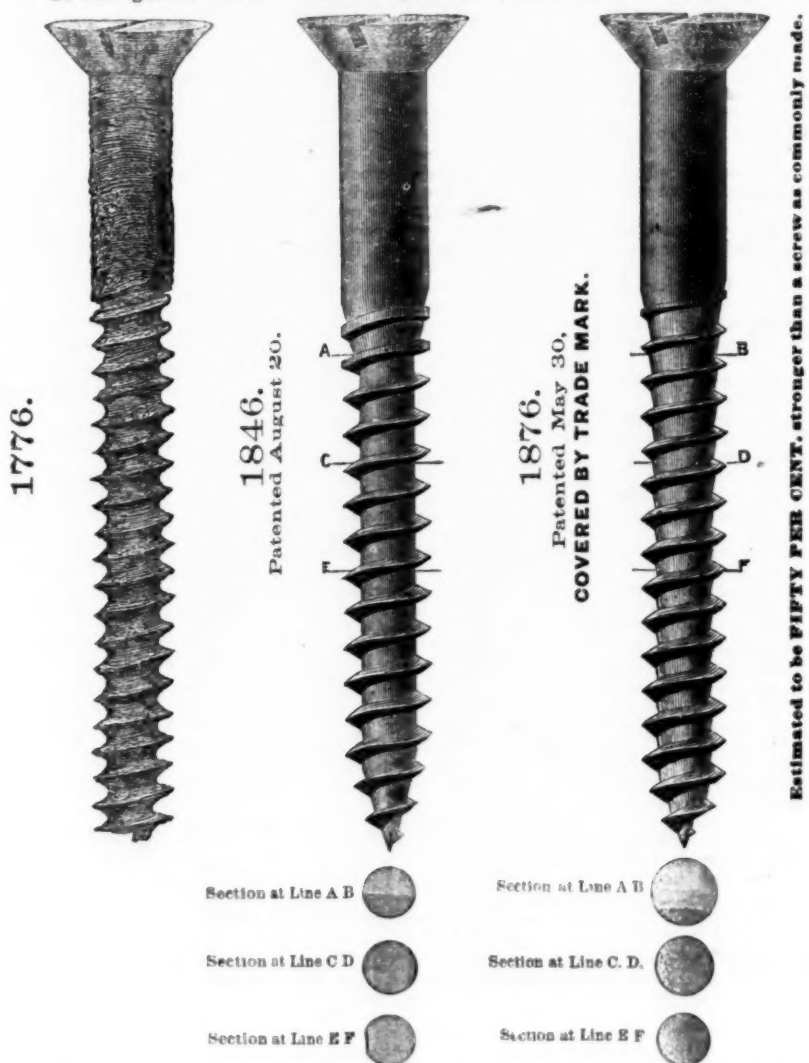


After forty years' experience we offer to the trade our Centennial Screw, patented May 30, 1876, as the best we have ever known.

The method of manufacturing is also patented, and we are changing our machinery as fast as possible, to manufacture the improved article only. To introduce them, they will be sold at same price as the old style screw.

The new screws will be packed in manila colored boxes with new label covering end of box, and enlarged figures showing plainly contents.

To distinguish this screw we have adopted a trade mark, which is also secured to us.



The above drawings show the progress of making screw from the old blunt point to style now adopted.

Experience has shown that the weak point of screws, as formerly made, is at the heel of the thread, where all the strains of forcing the screw into the wood naturally concentrate.

To avoid the sharp angle existing in the old style of screws has been the aim of all manufacturers, but every expedient hitherto adopted has proved as objectionable as the evil complained of.

It will be seen in our new screw that not only is the sharp angle avoided, but the strength very much increased, as illustrated above. See sections at lines.

### CLAIM.

"A Pointed Wood Screw having the outer periphery of the thread upon its body cylindrical, while a portion of the body below the thread and near the neck is conical, the remainder of the body to the point being cylindrical, and yet having all the thread brought to an edge of a constant angle, without jogs in the paths between the threads, substantially as described."

such other port or place, and the articles manufactured therefrom returned in bond to the port of importation for export; and every such bonded manufacturing warehouse shall be in charge of one or more storekeepers, who shall hold their appointments from the chief customs officer at the nearest port, and the amount of whose salaries shall be collected monthly by such chief officer from the owner or lessee of the warehouse, and the proof of the cancellation of the bonds given on the exportation of such manufactured articles shall consist of the oaths of the master and mate of the exporting vessel and the certificate of the consular officer of the United States at the port where the articles are landed, that such articles have been landed at such foreign port. The necessary regulations for carrying the provisions of this section into effect shall be prescribed by the Secretary of the Treasury.

Section 4. The importation into the United States of obscene articles is hereby prohibited, and all such articles, if imported, shall be seized, forfeited and destroyed under such regulations as may be prescribed by the Secretary of the Treasury.

#### COUNTERFEIT TRADE MARKS.

Section 5. No merchandise of foreign manufacture, which shall copy or simulate the name or trade mark of any domestic manufacturer, shall be admitted to entry unless such domestic manufacturer is the importer thereof, and all such merchandise, if imported, shall be seized, forfeited and destroyed, under such regulations as may be prescribed by the Secretary of the Treasury. And any domestic manufacturer may furnish copies or fac-similes of his trade marks to the Department of the Treasury for record and distribution to the proper customs officers.

#### PERSONAL EFFECTS.

Section 7. Wearing apparel of not to exceed \$200 in value, and other personal effects not to exceed \$500 in value, net merchandise, professional books, implements, instruments and tools of trade, occupation or employment of persons arriving in the United States, shall be admitted free of duty, but this exemption shall not be construed to include machinery or other articles imported for use in any manufacturing establishment, or for sale, and no duty shall be collected upon the importation of wearing apparel or personal effects taken out of and brought back to the United States by the owner thereof.

#### RULES REGARDING SUNKEN CARGO.

Section 8. Whenever any vessel laden with merchandise, in whole or in part subject to duty, has been sunk in any river, harbor, bay, or waters subject to the jurisdiction of the United States and within its limits for the period of two years, and is abandoned by the owner thereof, any person who may raise such vessel shall be permitted to bring any merchandise recovered therefrom into the port nearest to the place where such vessel was so raised, free from the payment of any duty thereupon and without being obliged to enter the same at the custom house, but under such regulations as the Secretary of the Treasury may prescribe.

#### REIMPORTATION OF LUMBER.

Section 9. The produce of the forests of the State of Maine, upon the St. John River and its tributaries, owned by American citizens, and sawed or hewed in the Province of New Brunswick by American citizens, the same being manufactured, in whole or in part, which is now admitted into the ports of the United States free of duty, shall continue to be so admitted, under such regulations as the Secretary of the Treasury shall from time to time prescribe.

#### LUMBER FROM THE ST. CROIX, ME., DISTRICT.

Section 10. The produce of the forests of the State of Maine, upon the St. Croix River and its tributaries, owned by American citizens, and sawed in the Province of New Brunswick by American citizens, the same being unmanufactured, in whole or in part, and having paid the same taxes as other American lumber on that river, shall be admitted into the ports of the United States free of duty, under such regulations as the Secretary of the Treasury shall from time to time prescribe.

#### BEET SUGAR MACHINERY.

Section 11. Machinery for the manufacture of beet sugar, and imported for that purpose solely, shall be exempted from duty.

#### RE-EXPORT OF MACHINERY.

Section 12. Machinery for repair may be imported into the United States without payment of duty, under bond to be given in double the appraised value thereof, to be withdrawn and exported after said machinery shall have been repaired; and the Secretary of the Treasury is authorized and directed to prescribe such rules and regulations as may be necessary to protect the revenue against fraud, and secure the identity and character of all such importations when again withdrawn and exported, restricting and limiting the export and withdrawal to the same port of entry where imported, and also limiting all bonds to a period of time of not more than six months from the date of the importation.

#### STEAM PLOUGHS.

Section 13. Machinery for agricultural purposes propelled by steam shall be free of duty.

#### WORKS OF ART FOR PUBLIC PROPERTY.

Section 14. All works of art and all articles of a scientific or artistic nature on character or intended for scientific purposes imported by any State or Territory, or by any municipal corporation or by any educational, religious, scientific or artistic association, intended for the use alone of such corporation or association as may import and not for exhibition or sale, shall be admitted free of duty under such regulations as may be prescribed by the Secretary of the Treasury, and if any association, duly authorized under the laws of the United States, or of any State or Territory for the promotion or encouragement of science, art or industry, shall import articles for exhibition, and not for sale, such articles shall be admitted to entry free of duty, under such regulations as may be prescribed by the Secretary of the Treasury; but bonds shall be given for the payment of the duties upon such articles



**B. KREISCHER & SON,**  
**New York Fire Brick &**  
**STATEN ISLAND**  
**CLAY RETORT WORKS,**  
 Established 1845.  
 Office, foot of Houston Street, East River,  
 NEW YORK.

The largest stock of Fire Brick of all shapes and sizes on hand, and made to order at short notice.  
 Cupola Brick, for McKean's Patent, and others. Fire Mortar, Ground Brick, Clay and Sand. Superior Kaolin for Rolling Mills and Foundries. Stone Ware and other Fire Clay and Sand, from my own mines at New Jersey and Staten Island, by the cargo or otherwise.

**NEWTON & CO.,**

Successors to

**PALMER, NEWTON & CO.,**

ALBANY, N. Y., Manufacturers

**FIRE BRICK**  
**Stove Linings,**  
**Range and Heater Linings**  
 Cylinder Brick, &c., &c.

**M. D. Valentine & Bro**  
 Manufacturers of

**FIRE BRICK**  
**And Furnace Blocks**  
**DRAIN PIPE & LAND TILE.**  
**Woodbridge, - - - N. J.**

**A. HALL & SONS, Perth Amboy, N. J.**

ESTABLISHED 1846.

**HALL & SONS, Buffalo, N. Y.**

ESTABLISHED 1866.

**FIRE BRICK**

of reliable quality for all purposes, manufactured at the best New Jersey Fire Clays. Also, Architecture Terra Cotta, Fire Clay, Fire Sand, Kaolin, Ground Fire Brick and Diamond Building Brick.

**Brooklyn Clay Retort**

AND

**FIRE BRICK WORKS.**

Manufacturers of Clay Retorts, Fire Bricks, Gas House and other Fire Clay and Fire Sand. Dealers in and Miners of Fire Clay and Fire Sand. Clay bank at Burr's Creek, New Jersey. Manufacture: Van Dyke, Elizabeth, Richards and Partition Sts., Brooklyn, N. Y. Office No. 88 Van Dyke St.

**MANHATTAN FIRE BRICK**  
 and Enamelled Clay Retort Works.

ADAM WEBER, Proprietor.

Office, 633 E. 15th St., N. Y. Clay Retorts, Enamelled for Gas Houses: Retorts for burning raw bone and returning bone for Bone Black. Fire Bricks, Fire Blocks, Cupola and Range Bricks of all shapes and sizes. The best fire clay from my own Clay beds at Perth Amboy, N. J.

**Watson Fire Brick Manufactory**

ESTABLISHED 1856.

**JOHN R. WATSON, Perth Amboy, New Jersey.**

Manufacturer of

**FIRE BRICK,**

For Rolling Mills, Blast Furnaces, Foundries, Gas Works, Lime Kilns, Tanneries, Boiler and Grate Setting, Glass Works, &c.  
 FIRE CLAYS, FIRE SAND, AND KAOLIN FOR SALE.

**HENRY MAURER,**

Proprietor of the

**Excelsior Fire Brick & Clay**  
**Retort Works,**

Manufacturer of **FIRE BRICK, HOLLOW**

**BRICK AND CLAY RETORTS.**

WORKS: PERTH AMBOY, NEW JERSEY

Office & Depot: 418 to 422 East 23d St., N. Y.

**TROY FIRE BRICK WORKS**

Troy, N. Y.,

**JAMES OSTRANDER & SON,**

ESTABLISHED 1848.

Manufacturers of

**FIRE BRICK,**

Tuyeres, Tiles, Blast Furnace Blocks, etc. Miners and Dealers in Woodbridge Fire Clay and Sand, and Staten Island Kaolin.

**Cumberland Fire Brick Works.**

**GARDNER, STUART & CO.,**

Manufacturers of

**STANDARD SAVAGE FIRE BRICK.**

OFFICE:

Room 3, No. 504 Fourth Ave., Pittsburgh, Pa.

WORKS:

One mile from Mt. Savage Junction, Md., B. & O. R. R.

Illustrated Circulars and Price Lists on application.

**Eagle Plumbago Co.**

Crucible, Lubricating, Electrotyping, Stove

Polish, and other grades of

**PLUMBAGO,**

FOR SALE BY

**CONGREVE & SANDERS, Sole Agents**

104 & 106 John St., New York.

**ICHAS. N. BACON,**

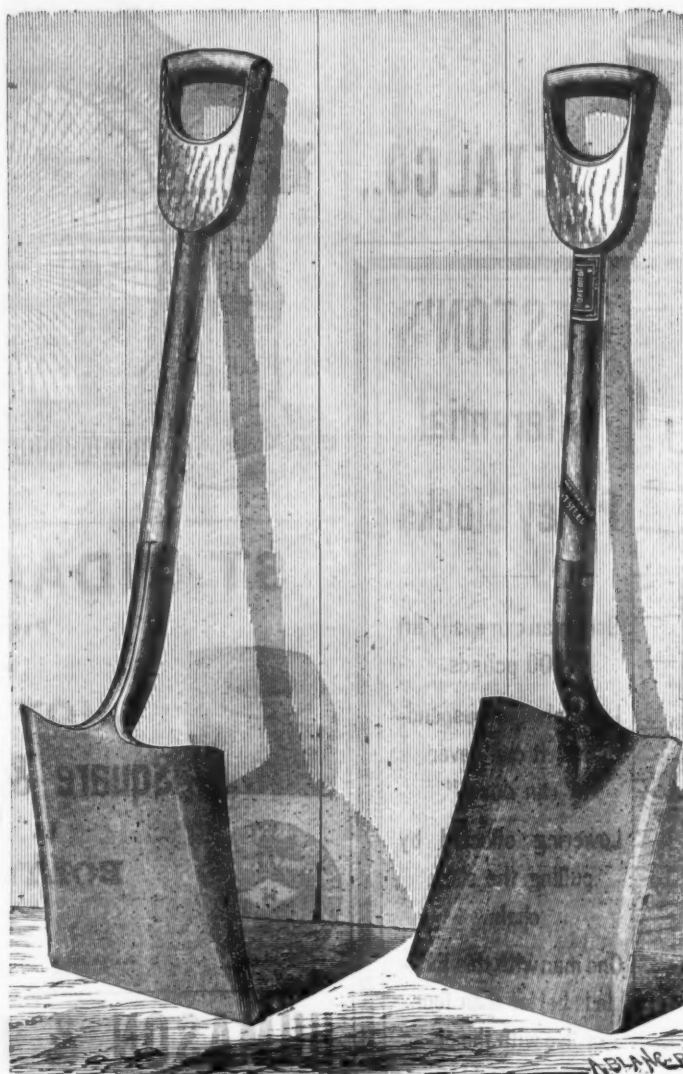
**Felting & Wadding Manufactory,**

Winchester, Mass.

Patent Felt Buffer Wheels for Hardware and Cutlery Manufacturers, Brass Finishers, Steam Fitters, Jewelers, &c. Felt for Boilers and Steam Pipes, Harness Makers, &c. Patent Black Board Erasers.

Office & Salesroom 22 Exchange Place Boston.

**B. ROWLAND & CO.,**  
**PHILADELPHIA.**



**THE**  
**OXFORD PATENT WELDED**  
**Solid Cast Steel Shovel.**  
**OIL TEMPERED.**

The Oxford Patent Welded Solid Cast Steel Shovel, as now furnished by us, is a new article of manufacture, of a single plate of Cast Steel, without rivets, welded by the Antrim process, with smooth surfaces front and back, and with socket continued some distance up the handle, completely encircling it in the manner of a ferrule, thus insuring a perfectly straight handle in every instance, and securing the qualities of absolute perfection of strength, and the greatest beauty of construction possible. Taken altogether, our methods will be found to obviate all the defects now so patent in all other Shovels, even those of first-class manufacture, and we will guarantee for them superior strength in parts usually the weakest, perfect symmetry and regularity of appearance, and wearing quality one-third greater than those of any other now made.

The same will apply to our Oxford Patent Welded Solid Cast Steel Spade, Long Handle Round Point Shovel and D Handle Molder Shovels in every respect.

**OXFORD**  
**Warranted Cast Steel.**

Goods of this stamp are made of the very best material, and are warranted. We will always replace them with new ones in every case where reasonable satisfaction is not given.

**B. ROWLAND & CO.,**  
 CITY OFFICE,  
 27 North Fifth Street, Philadelphia, U. S. A.  
 Works at Frankford, Phila., U. S. A.  
 NEW YORK WAREHOUSE, 100 Chambers St.

as shall not be exported within six months from the date of importation.

REIMPORTATION OF HOME PRODUCTS.

Section 16. Upon the reimportation of articles once exported of the growth, product, or manufacture of the United States upon which no internal tax has been assessed or paid, or upon which such tax has been paid or refunded by allowance or drawback, there shall be levied, collected and paid a duty equal to the tax imposed by the Internal Revenue laws upon such articles.

MODELS OF INVENTIONS.

Section 17. Models of inventions and other improvements in the arts shall be admitted to entry free of duty, but no article shall be deemed a model or improvement which shall be fitted for use.

LIFE-PRESERVING APPARATUS.

Section 18. Life-boats and life-preserving apparatus specially imported by and for societies incorporated or established to encourage the saving of human life, shall be admitted to entry free of duty.

RETURNED DOMESTIC MERCHANDISE.

Section 19. Merchandise of the manufacture of the United States, exported and returned, may be admitted to entry free of duty, under such regulations as may be prescribed by the Secretary of the Treasury; and if such articles were subject to Internal Revenue tax at the time of exportation and not refunded.

THE PENALTY OF DISCRIMINATION.

Section 20. The several rates of duty imposed by this act shall be assessed and paid upon all goods, wares and merchandise imported from countries or colonies which do not discriminate in their respective tariffs of duty upon imports by imposing higher rates upon imports from the United States than upon those from other countries; but in respect to imports from countries or colonies which do thus discriminate, there shall be levied, collected, and paid an additional duty of 10 per cent. upon the rates provided in this act.

REGISTRATION OF FOREIGN SHIPS.

Section 21. All materials for the construction, equipment, or repair of vessels of the United States, may be imported in bond and withdrawn therefrom, under such regulations as may be presented by the Secretary of the Treasury, and upon proof that such materials have been used for such purpose, no duties shall be paid thereon, and all vessels owned wholly by citizens of the United States shall be entitled to registry, enrollment and license, and to all the benefits and privileges of vessels of the United States, and all laws, or parts of laws, conflicting with the provisions of this section shall be, and the same are hereby repealed.

CUSTOMS DISTRICTS TO BE CONSOLIDATED.

Section 23. The Secretary of the Treasury is hereby authorized and directed to reduce the number of customs collection districts in the United States by consolidation of two or more districts, or parts thereof, in such manner that the expenses of conducting the business of any district shall not exceed 50 per cent. of the amount of customs duties collected therein; and he shall designate, in addition to the principal port of entry in each district, such subordinate ports of entry upon the sea coast and frontier as the interests of commerce may require, at which ports of entry imported merchandise shall be entered and appraised, and duties thereon collected or secured. The President of the United States may, by proclamation, upon the recommendation of the Secretary of the Treasury, whenever the interests of commerce require, change the location of the principal port of entry of any district to any other place in such district.

GOVERNMENT ARTICLES TO BE FREE.

Section 24. Articles imported for the use of the United States shall be admitted to entry free of duty.

GENERAL REPEAL OF TARIFF LAWS.

Section 25, Title 33. "Duties upon imports" and sections 3018, 3019, 3020, 3021, 3026 and 3433 of the Revised Statutes of the United States, and all other laws and parts of laws imposing duties upon merchandise imported into the United States, or conflicting with the provisions of this act, shall be and the same are hereby repealed.

The Pennsylvania Railroad.

The Pennsylvania Railroad has made up its statement of business for December sufficiently to be able to give an approximate of its earnings and expenses.

During December, 1877, all the lines east of Pittsburgh and Erie, when compared with December, 1876, show a decrease in gross earnings of \$241,175, a decrease in expenses of \$68,620, and a decrease in net earnings of \$172,555. For the year 1877, compared with the year 1876, all the lines east of Pittsburgh and Erie show a decrease in gross earnings of \$5,773,915, a decrease in expenses of \$3,052,762, and a decrease in net earnings of \$2,721,153. The lines operated by the Pennsylvania Railroad west of Pittsburgh for the year 1877, show a deficiency in meeting all liabilities of \$461,290. In considering this statement, which represents the traffic returns of the Pennsylvania Railroad for the past year, and gives, we are informed, a close approximation to the figures that will appear in the forthcoming annual report, it is important to remember that the comparison is made with the Centennial year, when the business of the railroad was largely increased by the heavy traffic arising from the Exhibition. The statement in a more extended form is as follows:

Gross earnings, east of Pittsburgh.....	\$11,147,145
Working expenses, east of Pittsburgh....	10,026,407
Net earnings, east of Pittsburgh.....	\$1,120,738
Deduct for deficit west of Pittsburgh....	461,290
Net earnings, all lines.....	\$659,448

For 1876 the net earnings east of Pittsburgh were \$1,809,831, and the loss on lines west of Pittsburgh was \$35,853, leaving the net earnings from all lines at \$1,773,978. This shows a net decrease from the earnings of 1876 of \$3,146,590. In 1876, however, there were paid for dividends (8 per cent.) and taxes, \$6,005,449. Last year one dividend of 2 per cent. and one of 1½ were paid, aggregating 3½ per cent., or \$2,927,383, showing a decrease in the payments on this account of \$3,378,066, or enough to balance the decrease in the net earnings, with \$231,466 to spare. The other items in the disbursement account, such as interest and rentals, will not be materially changed, and it is by no means likely that the decrease in the income from investments will be large enough to prevent the showing of a handsome surplus on the year's operations.

INDUSTRIAL ITEMS.

MASSACHUSETTS.

The Hinkley Locomotive Works of Boston, failed on Saturday. A statement shows liabilities of about \$300,000, about half of the paper being held by Boston banks. The property of the company is assessed at \$350,000.

The Upham Machine Company's stockholders, of Athol, chose a committee last Thursday week to close up the affairs of the company.

The Agawam Iron Works are running a night gang to fill orders.

RHODE ISLAND.

The Herreshoff Manufacturing Company, of Bristol, have a contract with the Spanish government to build a gunboat 135 feet in length, of light schooner rig, which will carry one steel rifle gun.

The stagnation in the market for war materials caused by the Russo-Russian armistice, has compelled the Providence Tool Company to partially suspend operations.

CONNECTICUT.

The Hills Archimedeon Lawn Mower Company, of Hartford, have recently received large orders for their machines from European sources, and will turn out about forty complete machines per day. They manufacture the Archimedeon hand and horse mowers, and the Charter Oak hand mowers in several sizes.

At the annual meeting of the Northfield Knife Company, Jan. 22, Messrs. F. H. Catlin and J. Howard Catlin were re-elected president and secretary.

NEW YORK.

Ten million penny whistles a year are made by a tin toy factory in this state.

PENNSYLVANIA.

Messrs. F. and G. Brooke, of Birdsboro, have erected an engine at what is known as the "Lyken's Mine" near Morgantown, Berks county, and are going to commence mining there at once.

John D. Miller is mining large quantities of iron ore at the old Wheatfield mines near Fritztown, for the Temple furnace. Levi A. Swoyer, manager at the Wheatfield mines for Messrs. Eckert & Bro., of the Henry Clay furnaces, Allentown, has contracted to deliver the iron ore from three mines at the Railroad stations.

The wire mills of South Easton have again been put in operation.

The Crane Iron Co. of Catsauguay, have made a change in their system of paying the men. Instead of pay every four weeks, or thirteen times a year, hereafter it will be arranged for pay every month, thereby lessening the work and making one less pay.

The United States Automatic Stoker Co., are meeting with excellent success in the introduction of their machines. The following testimonials have been received: "We have the stoker in use to one of our boilers, and it gives such satisfaction that we have made arrangements to apply it to two others. We burn a mixture of bituminous coal and anthracite dust, or bituminous and pea, in about equal proportions. We think it will save considerable coal, from the fact that the doors do not have to be opened except to remove the cinder, and also because it distributes the coal more evenly than it can be done by hand, and as it is applied to the fire in small quantities, much of the smoke is consumed. Respectfully yours, GEO. G. LOBBELL, President Lobdell Car Wheel Co." "Our stoker enables us to burn anthracite dust and bituminous coal in equal proportions, and we burn one-fifth less in weight than when using pea coal and the mixture costs nearly ten per cent. less than the latter. Yours &c., R. S. NEWBOLD & SOY." Messrs. Edward Samuel & Co., Philadelphia, who control the marine right for the United States, have recently placed one of these stokers on the steamship Virginia, of the Clyde line, with results of such a character as will no doubt lead to their extensive use on steamships. We expect to have the data, in the course of a few days, of a trip of the above vessel, Philadelphia to Charleston and return.

Mr. Harry H. Harner, a feeder in the nail factory of the Pottstown Iron Company, cut twenty kegs of 100 lbs. each, of twelve-penny nails, last Thursday the 24th ult.

The new iron ore mine on the lands of Henry Gilbert, on the Colebrookdale Railroad, between Bechtelsville and New Berlin, promises to be a very productive mine, as the finest ore can be found at a depth of five inches under the surface, and extends several hundred yards. R. F. Smith and K. Reiteman are the lessees.

Ellis & Wills, at Pottstown Iron and Brass Foundry, on Saturday the 26th ult., cast an anvil for the lower mill of the Pottstown Iron Company, weighing 2600 pounds, it being the largest anvil they ever cast. The firm are full of work. They have just completed the erection of a new cupola, and given their engine a thorough overhauling.

It is expected that the Scottsdale rolling mill will start up in a short time again. There are a great many idle men here, and all seem anxious to have the works move, as miners as well as mill men are dependent upon the mill running for their livelihood.

Rumor says the new mill of Reis, Brown & Berger, Newcastle, which has been idle for 18 months, will start this spring.

The Johnstown Mechanical Works have been transferred to a new company headed by Hon. D. J. Morrell. The price paid was \$25,000 cash, and the assumption of \$13,000 of debts.

The Blandon rolling mill has started on double turn. They are turning out from 50 to 60 tons of first-class iron per week. The new train of rolls is almost completed, when they will start on making cotton ties for the Southern markets.

George S. Bryant and Mr. Simons, of Schuylkill county, are about to build a new foundry at Limerick Station. The citizens



of the place have subscribed for the purchase of a lot on which to build, will furnish the stone for the edifice, and will contribute about \$1000 toward the enterprise.

There has been filed the certificate of the auditor general that a certified copy of the final decree of court, relative to the application of Seyfert, McManus & Co. for a change of their corporate title to that of Reading Iron Works had been filed in his office. This completes the proceedings in the matter of the change of title.

At Sharon, according to the *Herald*, business during last week was good, and no signs of hard times. At the new mill, puddle, guide and old hoop mills double turn; bar mill, single turn; new hoop mill and nail factory off. At the old mill, puddle, guide and hoop mills double turn; bar and sheet mill, single turn; nail factory, two days on; blast furnaces all right. We understand it is the intention to start Greenville Mill on Monday next. At the Stewart Iron Works, the bloom mill went on Tuesday morning, as noted last week, all things moving off lively. Blast furnace No. 2 is almost ready, with some new improvements.

Workmen are now engaged in loading at the Weimer Machine Works the blowing engine built for the North Jersey Iron Company, of Chester, N. J. The *Lebanon Times* says this wonderful little engine has been running on exhibition last week at Mr. Weimer's works, and was visited by many prominent furnace managers and proprietors, who all agree that the day of the cumbersome old-style blowing engine has gone by and that the "Weimer Blower" will be the furnace engine of the future. The contract speed of the engine is 200 revolutions per minute, but the maximum test was made up to 350 revolutions per minute, a speed heretofore unknown in piston blowing engines.

#### PITTSBURGH AND VICINITY.

Wightman's glass warehouse and stable, Thirty-sixth ward, this city, were destroyed by fire recently.

Duncan & Sons' press house started again on Monday, having been shut down three weeks for repairs.

The Edgar Thomson Steel Works, at Braddock, Pa., are at present giving employment to over 600 men. About 180 tons of steel rails is the average daily production of the rail department. The converting department (Bessemer process) is producing daily about 300 tons of steel ingots—average weight of these ingots being 6300 pounds each. This wonderful production is a sufficient comment upon the efficiency of the superintendent, Captain Jones.

The Ihmsen Glass Co. (Limited) is the style of the new glass company which will operate Ihmsen's old works. They will be ready to start in two weeks.

The National Tube Works, at McKeesport, intended to make an exhibit at the Paris Exposition, but abandoned the idea when it was discovered that the largest space they could get was an area of 8 by 14 feet. Few, if any, Pittsburghers will be represented in the big show.

#### WEST VIRGINIA.

The new board of the Benwood Iron Works organized by reelecting Alex. Laughlin, Esq., president, L. S. Delaplaine, vice-president, and Major Loring, secretary.

The new board of directors of the Wheeling Hinge Company organized by electing the following officers: President, A. G. Robinson; L. E. Hanson, vice-president; Jas. Dunning, superintendent; and David Baird, book-keeper. The factory is now running until 9 o'clock at night, having two months' work ahead.

Most of the Wheeling mills are in operation.

The Belmont Furnace was lighted up last Thursday.

#### OHIO.

Twenty-five employees of the Bellaire Goblet Works have been discharged because they refused to work till the proprietors would reinstate a man whom they had discharged for using impudent language. The works are running quietly with the new men, the only marked difference being in the lessened production, and the managers seem to prefer this to the former frequent disputes with employees.

The Baron Works, at Bellaire, have stopped a considerable part of their force in consequence of the lessened demands of trade.

The confirmation of the sale of the Ohio City Nail Mill is opposed on the ground that the sale was not made in accordance with law, and that the bonds under which the sale was made were improperly issued and usurious in their character.

The proprietors of the Scioto Furnace have furnished free reading rooms for the benefit of their employees.

The Howard Furnace has blown out.

Of the 13 furnaces located in the "new Ohio furnace region" (Hocking Valley), nine are now in blast, two will soon be blown in, and two are still in process of construction. Their height ranges from 41 to 52 feet, and their bosh diameter from 11½ to 16 feet.

The Charlotte Furnace Co., to whom the Iron Hills Furnace and lands were rented for two more years, have made during the last three years of their operation 7300 tons of iron. Their last year's blast commenced on the 24th of May and lasted 213 working days, during which time 2320 tons were made, a daily average of over 11 tons. The cost of the material smelted in producing one ton of iron is stated to us as follows:

127 bushels charcoal at 40¢.....\$7.88  
3½ tons of iron ore at \$1.40.....4.90  
Two-fifth ton limestone at 50¢......20

\$12.98

The Hubbard Rolling Mill is running full time, with fair prospects of continuing. A large ore crusher is being put in the mill.

The Licking Iron and Steel Works, at Covington, since they were started up (only a few months ago) have been running full with large orders constantly ahead of the capacity of the works. They contemplate the immediate addition of a new 8-inch train to be used exclusively for small iron, bands, hoops, &c., requiring rapid speed; also a 26-inch cylinder engine (long stroke). The office and warehouses of the company are at Cincinnati.

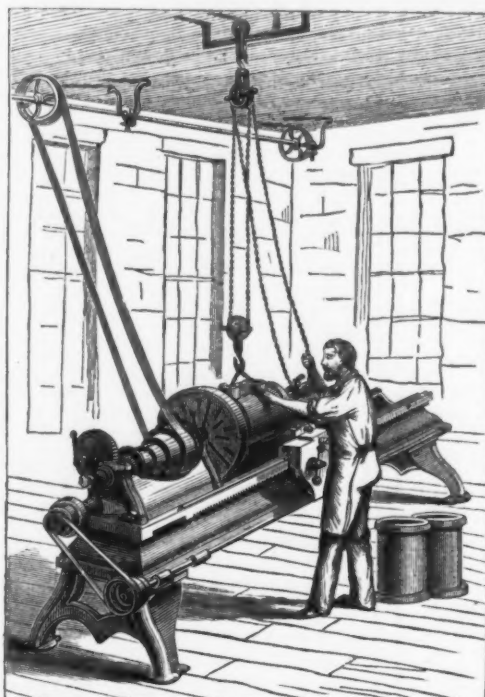
At a recent meeting of the directors of C. Russell & Co., it was decided to start up

## WHITE BRASS

For JOURNAL BEARINGS of all descriptions.



J. R. BAKER ANTI-FRICTION METAL CO.,  
400 Canal Street, New York.



As Applied to Machine Shop Use.

This labor-saving Pulley is of daily value in Machine Shops and Factories. The Mechanic is enabled without assistance, to safely adjust with accuracy large and heavy pieces of work in his lathe, and to alter their position by means of a traveler. In fact, the Pulley supplies a want in machine shops which nothing else entirely fills.

YALE LOCK MANUFACTURING CO.,  
STAMFORD, CONN.

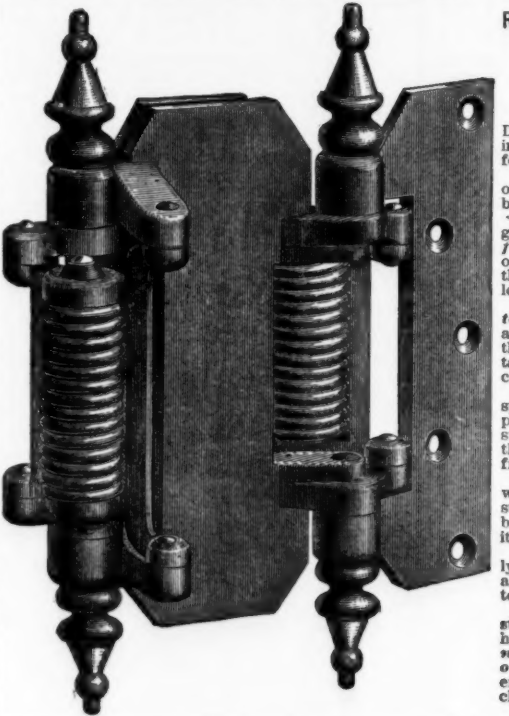
Sole makers in the United States.

NEW YORK SALESROOM - No. 53 Chambers St.

## The Cowles Hardware Co.,

UNIONVILLE, CONN., Manufacturers of

GEER'S DOUBLE & SINGLE ACTION SPRING BUTTS



Reverse in action and radically different from any other in market.

Patented July 17, 1877.

The accompanying cut shows our Double Action Spring Butts for swinging doors both ways. We claim the following points of superiority:

First.—These Butts differ from all others in principle and action, combining the *Toggle Arm* with the *Spring*, which by actual test gives out from 60 to 80 per cent. more force at the closing point than when opened to a right angle, thus holding the door firmly in place, and not allowing it to be moved by currents of air.

Second.—They will allow the door to be opened clear back to the wall, and the spring retains it there; thus the toggle and spring fill two important offices—that of holding the door closed and also open.

Third.—It is impossible to strain the spring, as there is not more than 50 per cent. of the elasticity of it used in swinging the door back to the wall, therefore it will not become weak from constant use.

Fourth.—The bearings are all faced with hardened steel, which is much superior to common cast iron or brass, both in regard to friction and durability.

Fifth.—They will hold the door firmly up to its place on the top, and not allow it to open off, thus obviating all tendency to sag.

Sixth.—These Butts are so constructed that there is no right or left hand. When adjusted to the door they never need taking up or letting out, as they are perfectly adapted for either summer or winter, without any change whatever.

Send for price lists and discounts.

THE CONNECTICUT VALLEY MFG. CO.,

CENTERBROOK, CONN., Manufacturers of

Lewis' Patent Single Twist Spur Bits,



GERMAN CIMLET BITS, etc.



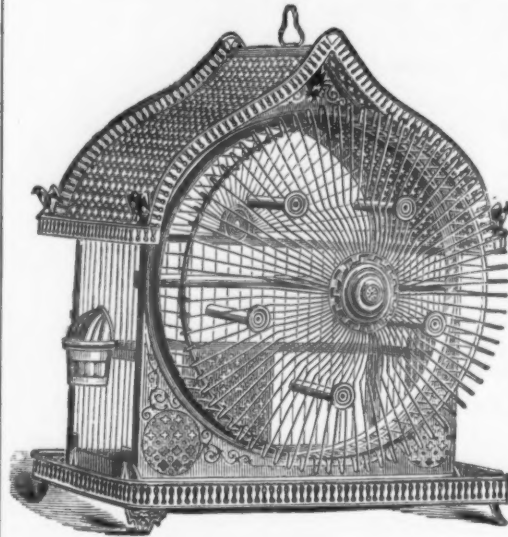
Send for our illustrated price list and discounts.

TRADE MARK.

## THE Revolving Perch Bird Cage.

Patented Sept. 21, 1869; Nov. 26, 1872; April 3, 1877.

A PLAY-HOUSE FOR THE WORLD'S PET.



"The pleasure and joy furnished 'Our Charmer' by this New Revolving Perch is wonderful to behold.

These Cages are designed to give the birds more exercise, making them stronger and healthier. Any canary will learn to work them in a very short time, and, once learned, it is surprising to see the amount of exercise a bird will take. Besides being very beneficial to the birds, these Cages are an ornament to any room. They are the perfection of workmanship, and are furnished with drawers. There is not the least doubt but that these elegant and useful Cages will become very popular.

Send for catalogue.

Manufactured only by

John C. Jewett & Sons,  
BUFFALO, N. Y.

## STANDARD NUT CO.,

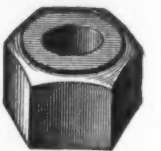
Pittsburgh, Pa.,

MANUFACTURERS OF



HOT PRESSED

Square & Hexagon Nuts,



R. R. FISH BARS,

BOLTS,

SPIKES,

RIVETS, &c.



## HUMASON & BECKLEY MFG. CO.,



WAREHOUSE,

100 Chambers St., New York.

Manufacturers of

HARDWARE

AND

POCKET CUTLERY.

HEADQUARTERS FOR

CORKSCREWS.

Nearly 100 different Styles and Sizes.

The Greatest variety made by any manufacturer in the World.

TENNIS & WILSON,  
SUCCESSORS TO

J. CLARK WILSON & CO.,

Hardware Commission Merchants,

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SOLE AGENTS FOR THE

Snell Mfg. Co. and Davis Level & Tool Co., Augers, Car Bits, Auger Bits, Boring Machines, Iron Inclometers, Plumbs and Levels, Iron Planes.

We are closing out the remnant stock of the late J. CLARK WILSON & Co. at great bargains.

## JOB T. PUGH'S Celebrated AUGERS and BITS.

WARRANTED SUPERIOR TO ANY OTHER MAKE.

They are made entirely by hand, and are especially adapted to hard wood. Supplied to the trade only. Gas Fitters', Millwrights', and Carpenters' Augers and Bits. Machine Bits of all descriptions made at short notice.

Office and Works,

Rear of Nos. 3112, 3114, 3116, 3118 & 3120 Market Street, Philadelphia, Pa.





**DUNBAR BROS.,**  
Manufacturers of  
**Clock Springs and Small Springs**  
of every description, from best Cast Steel,  
BRISTOL, CONN.

**FISHER'S MOWING MACHINE  
KNIFE CRINDER,**  
SICKLE EDGE HAY KNIVES, HAY FORKS, SEC-  
TIONS, &c., &c.  
Sold by Hardware and Implement Dealers  
everywhere. Illustrated Circular and  
Quotations sent free.  
HENRY FISHER, Canton, Ohio.

**SPENCER & UNDERHILL,**  
94 Chambers St., N. Y., Agents for  
American Screw Co.'s Wood, Machine and  
Rail Screws, Stove and Fire Bolts, Rivets, &c.  
O. Ames & Sons, Shovels, Spades and Shovels.  
A. Field & Son, Tacks, Brads, Nails, &c.  
G. F. Warner & Co., Carriage Clamps.  
We have also on hand a general assortment of Hardware



**NEWCOMB BROS.,**  
Manufacturers of  
506 Water St., N. Y.  
TENNIS & WILSON Agents,  
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**Job Lots of Hardware**  
Bought and Sold.  
Also a Full Line of Regular Goods  
on hand, lower than market rates.  
A. A. IRVINE,  
No. 14 Murray Street, New York.

**HAMMOND'S  
Window Springs**  
Support and lock sashes of all kinds and sizes; are  
very convenient, simple  
and durable; are easily  
and quickly on rated, and  
always sure to hold  
sashes in most desirable  
positions. Lower spring  
can be used in connection  
with a sash having  
weights, as well as for  
sale by most Philadelphia  
wholesale houses. Cir-  
culars give full details and  
full instructions.  
Samples mailed to  
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W. S. Hammond,  
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**Steel Castings,**  
Light and heavy Steel Castings of superior  
metal, solid and homogeneous. All work guaran-  
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EUREKA CAST STEEL CO.,  
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**FIRE HYDRANTS**  
AND  
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All Styles and Sizes.  
Made (and patents owned) by  
**THE  
MOHAWK & HUDSON  
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WATERFORD, N. Y.

**Coyle's Patent 3  
and Tube Brushes.**  
HENRY F. HAVERTY, Sole Proprietor  
and Manufacturer, Hedenberg Works,  
Newark, N. J.  
To these brushes 1st Premium, Medal and  
Diplomas were awarded at the fol-  
lowing fairs: Am. Institute, N. Y.; Mo.  
State, St. Louis; Ohio State, Columbu;  
Louisiana State, New Orleans; New Jer-  
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Patented in America and England.

**Wire-Drawing Machinery**  
complete, from Rods to No. 40 Wire, is manufac-  
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**S. HEALD & SON,**  
Send for prices &c. Barre, Mass.

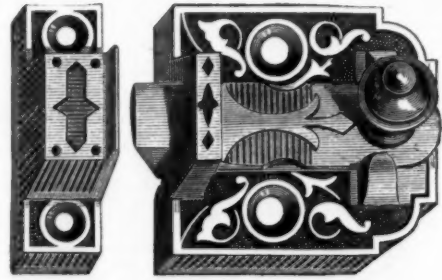
**CYLINDERS OF ALL SIZES,  
PUMPS & CORUITS**  
VALVES BORED OUT IN THEIR PRESENT  
POSITIONS AT REASONABLE RATES.  
**L. B. FLANDERS,**  
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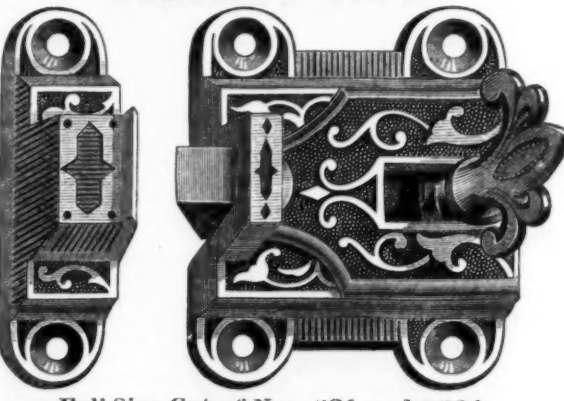
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**THE HART, BLIVEN & MEAD MFG. CO.,**  
MANUFACTURERS OF  
**GENERAL HARDWARE.**  
107 Chambers and 91 Reade Sts.,  
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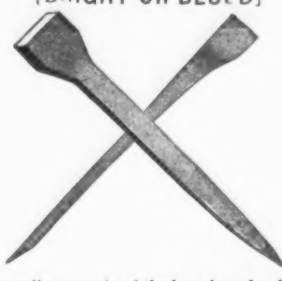
Factories at Kensington, Connecticut.  
Three Medals of Honor and three Diplomas of Merit  
Were awarded to THE HART, BLIVEN & MEAD MFG. CO., at the International  
Exhibition, Philadelphia, 1876, for  
Building & Household Hardware, Furniture Trimmings & Carpenters' Tools,  
**STATIONERY HARDWARE,**  
Carriage Hardware, comprising Bands and Sockets.  
Our complete Catalogue for 1878, containing all the goods we manufacture, is now ready for  
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**Burglar Proof Sash Fasteners.**  
The Cheapest and Best Burglar Proof Sash Fastener ever offered to the Trade.  
Full Size Cut of No. 252. Patented.  
Showing Sash Fastener Unlocked, packed one dozen in paper boxes, with Metal Knobs and Rivets. No. 252, Enameled, packed  
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**Drawer Pulls.**  
Full Size Cut of No. 160.  
Packed quarter gross in paper boxes. No. 160, 4 inch, Figured Enameled, Packed with Screws.

**Cupboard Catches.**  
Full Size Cut of Nos. 501 and 0501.  
Patented.  
Packed two dozen in paper boxes.  
No. 501, 1 1/2 inch, Enameled, packed with Screws.  
No. 0501, 1 1/2 inch, Bronze Metal packed with  
Screws.

**Cupboard Turns.**  
Full Size Cut of Nos. 321 and 0321.  
Patented.  
Packed one dozen in paper boxes, with Metal Knobs.  
No. 321, 1 1/4 inch, Enameled, packed with Screws.  
No. 0321, 1 1/4 inch Bronze Metal, packed with  
Screws.

**NATIONAL  
Horse Nail Co.**  
MANUFACTURERS OF  
**FINISHED**  
[BRIGHT OR BLUED]  
  
These nails are made of the best brands of NOR-  
WAY IRON, and are guaranteed to be equal to  
any in the market.  
**NATIONAL HORSE NAIL CO.,**  
VERGENNES, VT  
HORACE DURRE & CO., Agents,  
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TRADE MARK.  
  
If you want the best at reasonable prices,  
send for illustrated circular and price list of  
the celebrated  
Covert Harness Snap, Horse and  
Cattle Ties, Breast Chains, Halter  
Chains, Post Chains, Rein Chains, &c.  
These goods are sold by all leading jobbers in  
General and Saddlery Hardware at manufacturers'  
prices. Sample snap sent free of charge if desired.  
Address **COVERT MFG. CO.,**  
Sole Manufacturers, Troy, N. Y.

**JEWETT'S  
PATENT  
FILTER**  
WITH  
**Porcelain Lined  
COOLER.**  
Acknowledged the only  
complete Filter and Cooler  
in the world.  
Hardware, House Furnishing and Crockery Dealers  
can find no more valuable article, as this Filter is per-  
fect in its work of purifying water of every kind, at-  
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**JOHN C. JEWETT & SONS,**  
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**The Sugar Maker's Friend.**  
Agents wanted  
in every Sugar  
District to can-  
vass for the sale  
of  
Post's Patent Metallic Eureka Sap  
Spout and bucket Hanger. Samples,  
Circulars and Terms sent postpaid  
on receipt of 20 cents. Address  
**C. C. POST, Manuf., & Patentee, Burlington, Vt.**

**LEE BROTHERS,**  
Manufacturers of  
Lee's Miners' Lamps,  
with Patent Cover.  
Also, manufacturers of FURNACE LAMPS. The latter  
being a hand lamp for the use of Furnaces, Mills, Fac-  
tories, etc. Nine Miners' Lamps or five Furnace Lamps  
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Manufacturer and Wholesale Dealer in  
**Scythe, Axe, Knife and Hacker  
STONES.**

**LETOILE,  
UNION,  
PREMIUM,  
DIAMOND GRIT,  
WHITE MOUNTAIN  
INDIAN POND** (red end-  
stones gotten up or labeled in  
any style desired. Price and  
quality guaranteed.  
urstone are of good work  
and will not grate.  
**A. G. NEWMAN,**  
Successor to Newman & Capron, Manufacturer of  
Builders' Hardware, Railway Car Fixtures, Hatfield  
Pat. Shovels, Buckman Pat. Torsion Spring Butte, Bell  
Hangers' Supplies, &c., &c. Office, 1130 Broadway  
Works, 147 to 149 W. 24th St., New York.



their extensive reaper and mower works in Canton, which have been idle for several months. The immediate time for resuming work, however, has not yet been decided upon, though it will be an early day.

It is reported that a lock factory is to be started at Chagrin Falls.

C. Aultman & Co., Bucher, Gibbs & Co., and the Diebold Safe and Lock Company of Canton, will be represented in the Paris Exposition this year. Work has been resumed at the establishment of the latter company. The Massillon Rolling Mill enterprise has been abandoned.

The new Sarah Furnace will blow in, in six weeks or two months.

#### MICHIGAN.

From the Marquette Mining Journal of the 26th ult. we clip the following: The Pioneer Furnaces now draw a part of their charcoal supply from the kilns at Greenwood and Clarkburg, which they have leased from the assignee of the Michigan Iron Company.

The Carp and Pioneer are the only furnaces in this county now in blast. All the others are "out," and likely to remain so until there is a radical change for the better in the iron market.

At the annual meeting of the stockholders of the Pittsburgh and Lake Angeline Iron Company, the following directors were elected: John Outhwaite, Selah Chamberlain, H. B. Payne, Dan. P. Eells, James Farmer, A. B. Stone, C. H. Bulkley, H. A. Laughlin, Alfred Kidder. The following officers were subsequently elected by the board: John Outhwaite, president; Selah Chamberlain, vice-president; J. H. Outhwaite, secretary and treasurer.

Early on Monday morning, the 28th ult., the blast furnace of the Eureka Iron Co., after a run of 16 months, during which it has made 8300 tons of iron, went out of blast. The hearth was in good condition, and although this is the longest run ever made, the furnace could have continued blowing six or eight months longer.

#### ILLINOIS.

The Belleville Nail Works Company are adding eight new nail machines to the 48 machines now in use. The capacity of the works will be increased by the new machines 150 to 175 kegs daily.

The receiver of the Joliet Mill is making every possible effort to bring about a satisfactory understanding between the stockholders and the bondholders. If he succeeds, it is thought that he will be able to start up early in the spring.

The branch of trade in Chicago in which there were most failures last year was that covering the hardware, stove, iron and brass business, in which the failures numbered 31.

#### KENTUCKY.

The Ashland Furnace is in blast.

Col. S. Elford, manager of Hunnewell Furnace, kindly furnishes the following data regarding last year's work of that furnace: "Blowing 302 days, the furnace made 5265 tons of iron—a daily average of 17.43 tons—using 14,312 tons of ore and 694,843 bushels of charcoal. This represents an average of material consumed to the ton of pig iron made of 132 bushels of charcoal and 2.72 of iron ore—a very satisfactory result.—Greenup Independent.

#### COLORADO.

The Rocky Mountain News, Denver, says: The Colorado Iron Works, which commenced operations in 1876, have made some half dozen stamp mills since last July, numbering 125 stamps, with the accompanying boilers and engines. This company have within the past year turned out about 300 tons of castings, amounting in value to some \$60,000. They employ from 15 to 25 men, and have capital employed in their business to about \$30,000.

#### GEORGIA.

Bartow Furnace, in Bartow county, 90 miles from Chattanooga, blew out on the 29th ult. The furnace was making 25 tons of coke iron daily when it stopped. There was no stock of pig on hand when she blew out. The furnace has been in the hands of the Vulcan Iron and Nail Works Company of Chattanooga, who used up the pig as fast as it was produced. The probability is the stoppage will only be temporary, and that the furnace will be in blast again soon. The furnace is in first rate repair, having recently been thoroughly overhauled.

By virtue of a late decision of the United States District Court for the District of Georgia, Rising Fawn Furnace in Dade county, on the Alabama and Great Southern road, 23 miles south of Chattanooga, has passed into the hands of Col. B. E. Wells, as receiver. Whether the furnace will continue in blast it is impossible to say.

### Special Notices.

#### To Manufacturers and Jobbers of Hardware, Cutlery, &c.

Manufacturers and Jobbers, having surplus stocks or goods that from any cause are unsaleable upon which they wish to realize, or assignees who have stocks to dispose of, will find a cash purchaser by communicating with

**W. M. CALDWELL,**  
Dealer in  
Job and Auction Lots of Hardware,  
Cutlery, &c.,  
102 Chambers St., New York.

## Price Book

for General Hardware.  
Half leather, \$10; full leather, \$12. Send for descriptive circular.  
Letters from customers.  
"I observe your ad in The Iron Age of 15th. Inclosed I hand you \$12. Please send full bound book at once."  
BUELL LAMBERSON, 57 Chambers St., N. Y.

### Belgian Iron Agent.

Wanted, in each province in America, a good agent for Rolled Iron.

**R. L.,**  
82, Post Office, Liege, Belgium.

### Special Notices.

#### CINTI STEEL MARKET.

Having been engaged for the past 12 years at this point in conducting the interest of two of the largest Steel Works of Pittsburgh, am now open for a business engagement in the same line. Would be pleased to correspond with any party desiring a representation here. Address  
**W. R. FULLERTON, Cinti. O.**

### Wanted,

#### SECOND-HAND STEAM HAMMER

of from 5 to 10 tons weight, also a

#### LARGE DRILL,

suitable for a forge. Address, with price, description, &c.,

**JOSEPH D. WEEKS,**

Office of The Iron Age, 77 4th Ave., Pittsburgh, Pa.

### For Sale,

The Hardware Business, Stock, Trade and Good Will owned by the estate of the late HUNTER W. EATON, in Bradford, Orange Co., Vermont.  
For information, apply in person or by letter to  
**H. A. WINSHIP, Attorney,**  
Bradford, Vt.

#### New and Second-Hand Tools.

One 36 in. x 24 ft. triple geared lathe; one 18 in. x 10 ft. lathe; one 42 in. x 16 ft. planer; one 30 in. x 6 ft. one 26 in. x 6 ft. one 27 in. x 5 ft. do.; one heavy upright drill, self feed and back gear; one Putnam gear cutter; one No. 3 Wilder press; one No. 4 Stiles do.; one Smith & Garvin milling machine; one very heavy milling machine; one 28 in. x 16 ft. English lathe, cheap; two 10 h. p. Baxter Engines; one 6 h. p. do.; one Harkins 6 h. p. engine; one 60 in. x 75 ft. saw mill.

**The Bullard Machine Co., Limited,**  
No. 14 Dey Street, New York.

THE FIRM OF JESUP & STERLING HAVING been dissolved December 31, 1877, the undersigned will continue the business of Railroad, Contractors' and Machinists' Supplies, and will also act as Purchasing and Selling Agents for manufacturers and others, at 23 Cliff Street, New York.  
**F. W. JESUP.**

### A YOUNG MAN

who speaks English, German and French, has served apprenticeship in Machine Shop and has had a thorough course of engineering at a Polytechnic in Germany, seeks employment as draughtsman or to represent a firm at the Paris Exposition. References unexceptionable.

Address  
**ENGINEER,**  
Sun Office, Baltimore, Md.

PARTNER WITH A FEW THOUSAND dollars wanted, to start the manufacture of Nails in Pueblo, Colorado. Call or address  
**PHILADELPHIA NAIL WORKS,**  
at Machinery Depot, 135 N. Third St., Philadelphia.

### For Sale,

#### The Entire Stock of Heavy and Shelf Hardware,

doing an increasing business in one of the most flourishing towns in Northern Indiana, population about 8000. The stock is new and clean. Good reasons given for selling. The chance is first-class for any one wishing to go into the business.

Address  
**A. H.,**  
care HART, BLIVEN & MEAD, New York.

WANTED—A POSITION AS SALESMAN, Traveler, Agent, or Manager, with a firm manufacturing Pig or Wrought Iron or Cast Steel. Address  
**JAMES HENDERSON,**  
30 Vesey St., New York.

### For Sale, or Let on Royalty,

Patent No. 189,287, dated April 3, 1877. The best Mosquito Net Frame out. Is made of 3/4 inch rod iron and 3/4 and 3/8 inch gas tubing. Thousands can be sold, as it is the handsomest and best adjustable frame extant. For terms, etc., address the patentee,  
**J. F. VOLLE, Houston, Texas.**

N. B.—If not sold in four weeks, will manufacture myself.

### NOTICE.

PHILADELPHIA, April 5, 1877.  
On and after April 10th the Shipping Agency of The Pennsylvania Warehousing and Safe Deposit Co., at Perth Amboy, New Jersey, will be discontinued.

### To Nail Makers.

For Sale or Lease on reasonable terms, the

#### North Western Rolling Mills and Nail Works,

Situated at Dunleith, Ill., on Mississippi River, and close to track of Ill. Cent. R. R. New and improved machinery in best condition. Scrap iron and coal to be had cheap. A splendid chance to practical man with moderate capital. Reason for selling, proprietor does not understand business.

Will exchange for good lands, iron lands preferred. Address

**G. T. WALKER, Proprietor,**  
Lancaster, Wisconsin.

### Harrison Bros. & Howson,

SHEFFIELD AND LONDON,

Manufacturers and Importers of

#### Table & Pocket Cutlery, SCISSORS, RAZORS,

Butchers' Knives, Farriers' Knives, AND

House Furnishing Goods.

No 26 CLIFF ST., NEW YORK.

**W. C. BURKINSHAW, Sole Agent.**

### Special Notices.

#### DROP FORGINGS.

The TRENTON VISE & TOOL WORKS, Trenton, N. J., having increased their facilities, are now able to do all kinds of

Iron and Steel Drop Forgings in quantities to order at reasonable rates.

**HEERMANN BOKER & CO., Proprietors,**  
101 & 103 Duane St., N. Y.

### SPECIAL NOTICE.

The undersigned offer their services as agents to American Producers of Metals.

They represent foreign brands of

Zinc, Russia Iron, Hoop Iron, Window Glass, Cutlery and Guns.

**LOUIS WINDMULLER & ROELKER,**  
20 Reade Street, N. Y.

### Attention.

Dealers in Hardware, Iron and Steel, Coach Makers' and Blacksmiths' Supplies and general Machinery will find it greatly to their interests to write for descriptive circular and discounts of the Improved "Eclipse" Fan Blower, for home and export trade. Is cheaper, better and more durable than the bellows, requires only 12x20 inches floor space. See cut and description in The Iron Age of May 17, 1877.

Address  
**EDRA F. LANDIS,**  
Lancaster, Pa.

### Torrence & Co.,

#### General Shipping & Commission Merchants,

127 Walnut Street, Philadelphia.

We are acting for a number of prominent manufacturers in finding a foreign market for their goods, and would be pleased to correspond with any parties who may desire to develop this trade.

### For Sale.

An old-established Hardware and Stove House, in a splendid location, doing a large and increasing trade.

Address  
**J. C.,**  
Care of Biddle Hardware Co., Philadelphia.

**PAUL HYAN, 16 Magazine Strasse,**  
Berlin, Prussia.

Is desirous of assuming a few more agencies for Germany of American manufacturers of reputation. He is a man of standing, responsibility and long experience in architectural and manufacturing matters. During 20 years he has been proprietor of one of the most prominent manufacturing architectural goods, and is now owner of a commodious store, centrally located at Berlin, where he can exhibit goods and samples to advantage. Arrangements will, if desired, be made by him to have his constituents properly represented at the Paris Exposition of 1878. References: Messrs. Gardner & Co.; Messrs. Steinway & Sons, New York.

### International Exhibition

#### Agricultural Machines and Implements,

Hamburg, Germany, 1878.

Under co-operation of the Section for Agriculture and Horticulture at Hamburg, and the Union of German Manufacturers and Dealers in Agricultural Machines, an International Exhibition of Agricultural Machines and Implements will be held at Hamburg, Germany, beginning on the 13th of June, 1878, and ending the 17th of the same month.

Circulars and printings to be filled out for sending goods to the said International Exhibition are mailed free of charge, upon application, from the office of the undersigned committee, at

No. 25 A B C Street, Hamburg.

The Committee for the International Exhibition of Agricultural Machines and Implements, at Hamburg, 1878.

**ALB. VON OHLENDORFF, President.**

**HERM. SCHEMMANN, Treasurer.**

**DR. RICHARD SEELEMANN, Sec'y.**

### AUSTRALIA.

#### AMERICAN HARDWARE CO.,

No. 9 WILLIAM STREET, MELBOURNE, AUSTRALIA.

Solicit correspondence with American manufacturers desirous of representation in the Australian Colonies. Consignments will have prompt attention. References furnished.

**SITUATION WANTED—BY A GENTLE-**

man who has had 15 years' experience in all the departments of a wholesale commission Hardware house, as bookkeeper and correspondent in a commission or jobbing house, or as secretary and correspondent in a manufacturing establishment. Can give undoubted reference as to capability and character, and for a position of trust could give security if required. Address  
**H. O. J.,**  
care of Samuel Wilkins, 33 Murray St., N. Y. City.

### SITUATION WANTED—BY A YOUNG

man who has had 15 years' general experience in the Hardware business, wholesale and retail. Good reference. Address  
**JAS. E. BROWN,**  
915 Locust St., Philadelphia, Pa.

### JOBGING HARDWARE BUSINESS

#### For Sale.

The undersigned offer for sale the stock, fixtures and the good will of their business, which has been established in Chicago for the past 14 years. Stock is fresh, well assorted and adapted to the wants of the Western trade. For parties desirous of going into business this is an opportunity that seldom presents itself, as the business has been a paying one and extends throughout the Northwest. Address  
**MILLER BROTHERS & KEPP,**  
Chicago, January 19, 1878. 19 Lake Street.

### For Sale,

an old-established Stove Foundry, with excellent molding sand on the premises, located convenient to the Lehigh coal and iron region, and at the junction of six railroads, giving superior facilities for shipping to all points. Address

**H. A. PATTERSON,**  
27 Park Row, New York.

### Wanted,

a new or second-hand (good 'as new') strong, first-class Lathe for turning shafting

Address  
**Drawer E,**  
Ansonia, Ct.

### Special Notices.

#### The Sherman Process Company,

PROPRIETORS OF THE

"SHERMAN" PATENTS,

Is now ready to

Issue Licenses to use the said Process under a Royalty.

The Process is used to great profit in the

Puddling Furnace, Martin-Siemens Furnace, Bessemer Converter, Crucible, and for

Gray Iron Castings.

The use of the Process does not involve any changes in the furnaces or in the present manner of working them, nor does it increase the labor, but on the contrary saves material, fuel, labor and time.

The chemicals used are not expensive, their cost not exceeding 25 cents per ton of product, and the charge for royalty is placed at a low price so as to bring the Process into general use.

By the use of this Process a large percentage of the cheaper grades of irons and steels can be made into a good merchantable product.

Irons which have been found impossible to use either alone or in mixture with other irons are now being profitably used by means of this Process.

It improves the working of both poor and good irons or steels, a better product being obtained by its use than is possible without it. It makes the molten metal more fluid and the product more sound, homogeneous and ductile.

It makes less skull and scrap and less waste in the finished product.

It greatly improves sulphurous and phosphorus irons and steels, making them less red and cold short, and produces a more even product.

For castings that are to be tapped and have threads cut upon them, it allows a close, strong iron to be used, leaving it soft for the tool to readily cut.

By the use of this Process in the Bessemer or Martin-Siemens furnace, good steel rails can be made from a mixture of from 30 to 50 of old iron rails and the balance good stock. Thousands of tons of steel rails made by this Process, as above are now being used in France.

The Process will be demonstrated without expense, at the works of parties applying, and the amount of royalty to be charged for its use will be furnished upon application to

**The Sherman Process Co.,**  
No. 9 Pemberton Square,

BOSTON, MASS.

See page 17 of The Iron Age, of Oct. 25, 1877.

### AUCTION NOTICE FOR 1878.

#### Bissell & Welles,

WHOLESALE AUCTIONEERS AND COMMISSION MERCHANTS,

No. 15 Murray Street, New York.

Would solicit from manufacturers and Importers consignments of Hardware, Cutlery and House Furnishing Goods for their Spring Auction Sales, and are prepared to extend every facility for the disposing of surplus stocks for immediate cash.

Having had long experience and a thorough knowledge of all classes of hardware, and our acquaintance being extensive, our sales are largely attended by city and country buyers, making them unusually successful. We refer to the entire hardware trade of New York.

### For Sale,

#### Stove Foundry, Patterns, Flasks and Materials.

In order to settle the estate of the late James Wager, his executors offer for sale the Stove Foundry, together with the entire stock of Patterns, Flasks, Stoves, Ranges and all material belonging to the Wager Stove Company. The foundry is situated in the northern part of the village of West Troy, on the Erie Canal, and convenient to the Hudson River and the railroads. The assortment of Patterns for Ranges, Cook and Heating Stoves is very full and complete, and a rare opportunity is offered to obtain a complete outfit for the stove business on very advantageous terms.

Would prefer to sell the entire lot of patterns, &c., together with the foundry property, to one party, or would lease the foundry on very favorable terms to a party purchasing the patterns, &c., or would sell the patterns, flasks, &c., delivered to railroad or boats. Will forward illustrated catalogue of goods manufactured by us to parties desiring to purchase on application. Address  
**WAGER STOVE CO.,**  
Troy, N. Y.,

or Isaac G. Johnson, Spuyten Duyvil, N. Y.

### Notice of Removal.

30 CHAMBERS ST. New York, Jan. 1, 1878.  
I beg to advise that I have removed from Nos. 101 and 103 Duane street to No. 30 Chambers street, where samples can be inspected and communications addressed.

Yours respectfully,

**ASLINE WARD,**

Agent for

**Geo. Wostenholm & Son, "Limited,"**

Washington Works, Sheffield, and

**Fredk Ward & Co.,** 37 George St., Sheffield.

P. O. Box No. 163, New York.

### 10,000 FEET WATER FRONT.

The best and cheapest manufacturing sites within fifteen miles of New York City, situated at Elizabethport, New Jersey, on 11 1/2 of New Jersey Central Railroad, (coal road) and contiguous to Pennsylvania Railroad, with ample depth of water and water communication. Apply or address  
**D. BLAKE BONNETT,**  
414 South Broad Street  
Elizabeth, New Jersey.

### A RARE OPPORTUNITY.—A NEW

Factory, with engine, boiler, shafting, &c., in a splendid location, suitable for manufacturing, will be sold for less than one-half its original cost, or will be leased on easy terms. For particulars address  
**L. A. LAWTON, Herkimer, N. Y.**

### WANTED.—A first-class business man fami-

liar with machinery and manufacturing, capable of handling large bodies of men, desiring a responsible position. References satisfactory. Address,  
**IRON AND STEEL,**  
Care of P. O. Box 813, Bridgeport, Conn.

### Wanted—A Partner,

In a foundry and machine business, already well established. Locality splendid and healthy.

A practical man with means is wanted to join a practical man who is already well established.

Address  
**CAR WHEEL FOUNDRY,**  
P. O. Box 134, Selma, Alabama.

### Inventors

of articles in Builders' Hardware desiring to dispose of same by sale or on royalty on reasonable terms, may address  
**IRONMONGER,**  
Office of The Iron Age, 82 Reade St., New York.

### NOW READY.



### For February

PUBLISHED MONTHLY BY

**DAVID WILLIAMS,**

No. 83 READE ST., NEW YORK.

Branch Offices,

220 South Fourth St., Philadelphia.

77 Fourth Ave., Pittsburgh, Pa.

Subscription, including Postage to any address, domestic or foreign,

\$5.00 - - - A YEAR.

Single Copies, 50 Cents.

### CONTENTS.

Vol. 1. FEBRUARY, 1878. No. 6.



FOUNDRY TOOLS.

Straits, 14½@14¾¢; English Refined, 14¾¢; do. Common, 14½¢; and Banca, 17½@17¾¢, all gold. The following is an extract from a letter of a prominent house



in the Straits trade in London, dated January 22d, which we reproduce in full on account of its solid worth, fully concurring with the writer in what he says: "We can report no improvement in the state of business here, but at least it is not worse than it was at the end of the year, and if the Eastern question were once fairly cleared away, we would hope for much brisker markets. Tin is dull at £63 @ £63. 10/ for Straits and Australian. This is partly the result of the general depression, partly in consequence of large shipments being expected during the current month, and perhaps a little owing to the desire of operators who are now buying in Singapore and Penang to keep this market as low as possible. We continue of opinion that we must count on full supplies of Tin during 1878 from all the sources of production, not excluding Cornwall, and that an advance in price can be expected only from the change of feeling that will result from better general trade. If business generally were to revive, £63 would be thought extremely cheap for Tin, and the value might advance £10 without any change in the facts special to Tin. We say that full supplies must be expected from Cornwall, because we learn that, while the poorer mines may have to close if present prices are to continue, those mines that are kept working are likely to produce larger quantities with the help of the new boring apparatus, and to make up in quantity for deficient return per ton. The English production is not likely to fall below 8500 tons. What seems to us the most important fact to bear in mind regarding Tin is that the visible supply on the 1st of January this year, large as it looked—15,500 tons—is not, in proportion to the present scale of deliveries, so large as was the visible supply 10 years ago—10,100 tons—to the deliveries at this time, while the price was then £87, or fully 30% higher than to-day's value. True, at that time a much larger proportion of the visible supply consisted of what was held in Holland and on the water by the Dutch Trading Company, and that was not then regarded as available supply." Tin Plates, although but moderately active, are not as weak as they were a week ago. We quote, ordinary brands, gold, per box, large lines, as follows: Charcoal Bright, \$6.12½ @ \$6.25; ditto Tarned, \$5.75 @ \$5.87½; Coke Tin, \$5.37½ @ \$5.50; and ditto Tarned, \$5.25 @ \$5.37½.

Lead continues downward. Of Common Domestic some 150 tons St. Joseph and other brands sold at 3½¢, currency, while fine has not brought over 4¢, currency, in small parcels. The San Francisco Commercial Herald, under date of Jan. 24, says: "The Selby Smelting Works Co., in this city, produced during 1877, 5012 tons Pig Lead. Of these 499 tons were shipped to China, 2797 tons to New York, besides consumed here 2616 tons. The Richmond Consolidated Mine, at Eureka, Nev., produced 5200 tons Pig Lead in 1877. Of these 200 tons were sold here, a little to China, and balance sent to New York. It is expected that during 1878 the Pig Lead produced at the Eureka Consolidated, located at same place as the Richmond, will be shipped here rather than to the East by rail, as heretofore." From England they write under date January 22d, as follows: "The feeling is easier, and the price correspondingly lower, values being—English Pig, £10. 2/6; Sheet, £20. 5/; Pipe, £20. 15/; and Spanish Pig, £18. 17/6." Manufactured is steady at the decline established; we quote Bar 6¢; Pipe, 6¢; Sheet, 6½¢; and Tin Lined Lead Pipe, 15¢, all less 10¢ cent. to the trade.

Spelter and Zinc.—Domestic Spelter is moderately active at 5½¢ @ 5½¢, currency. There is a good deal of talk about the contemplated reduction of the output out West, and producers may possibly adopt such a course. Should, in this event of a curtailment taking place, the price of the domestic article rise sufficiently, the importation of foreign will be resumed at once and check any further material improvement. Foreign, of which there is none here at present, can be sold at 6¢, gold. Sheet Zinc.—Sheet is stagnant, but prices are unaltered. We quote: Mosselman, 8¢ @ 8½¢, gold, and Domestic, 7½¢ @ 7½¢, currency, nominally.

Nickel.—Although there is not much doing the metal is now steady at \$1.50 @ \$1.60, currency, 1½ lb.

Antimony.—We hear of none but trifling sales. The asking price for "Hallett" is 12¢, gold, and for "Cookson" 12½¢, gold. Both brands and all others are wired indiscriminately £51 from London, and strong.

### COAL.

The characteristic feature of the trade this week is its quietness. Trinity Building, and Broadway in front of Trinity Churchyard, are thronged with boatmen, which in itself is a very good indication of the quiet state of the trade. The stoppages ordered for the present month will materially reduce the amount of Coal coming to tide water, and it is hoped that they will sufficiently regulate the tonnage to keep up the prices. Present sales seem to be largely made from Coal in stock, which, from current reports, is being rapidly reduced in quantity.

Stocks on hand among the retail dealers are large; hence there is not a very active demand from them. Manufacturing sizes are more in demand, and we hear that Lehigh Lump is somewhat scarce. People in general seem to have little faith in the combination. "We were waiting to see what the results are to be," was the remark of a prominent coal man yesterday, and he went on to say that the future would show perfect unity of action among the companies. The Delaware and Hudson Canal Co. quote prices as follows:

Lump.....\$3.25  
Steamer.....3.25  
Gravel.....3.25  
Egg.....3.35  
Stove.....3.75  
Chester.....3.50  
which are the same as their last circular.

The Lehigh Valley quote prices practically the same. They are:

Spring Mountain.....Lp. Str. Br. Egg. Sto. Chit.  
Lehigh.....3.75 3.50 3.50 3.75 3.25  
Spring Brook Lehigh.....3.75 3.50 3.50 3.75 3.25

Jeddo Lehigh.....3.75 3.50 3.50 3.75 3.25  
Highland Lehigh.....3.75 3.50 3.50 3.75 3.25  
Philadelphia Coal.....3.50 3.50 3.50 3.75 3.25  
Wyoming.....3.50 3.50 3.50 3.75 3.25  
Franklin Wilkesbarre.....3.50 3.50 3.50 3.75 3.25  
On the part of most Coal men there is a considerable reluctance to quote prices at all, many of them saying that any figures they could give would only stand for the day.

### EXPORTS

of Hardware, Iron, Machinery, Metals, &c., from the Port of New York, for the Week ending Feb. 5, 1878.

Stettin.	Quan. Value.	Cuba.	Quan. Value.
Spelter plates, 1779	\$6,400	R. R. iron, cars 141	\$1,198
Hamburg.		Hoops, 52000	1,226
Revolvers, cs. 255	16,890	Mf. iron, pkgs 279	5,944
Clocks, cs. 65	1,971	Spikes, kegs 37	180
Lea, belt, cs. 2	804	R. R. track, 1300	8,728
Hdw., cs. 43	1,333	Locomotive, 1	9,000
Copper, cs. 35	9,000	Mf. wire, pkgs 2	672
Mach'y, cs. 24	4,680	Sew. mach., cs 14	307
Mf. iron, pkgs. 13	258	Belting, bale 1	100
Ag. imp., pkgs 3	260	Mach'y, pkgs. 21	592
Wheels, pkgs. 2	97	Hdw., cs. 31	697
		French West Indies.	

Bremen.	Quan. Value.	San Francisco.	Quan. Value.
Sandpaper, cs. 2	130	Carriages, 7	1,561
Ag. imp., pkgs 65	2,077		
Hdw., cs. 95	2,765		
Gas fixt., bxs. 8	139		
Mach'y, pkgs. 7	530		

Rotterdam.	Quan. Value.	San Francisco.	Quan. Value.
Pumps, pkgs. 16	1,540		
Syringes, case 1	260		
Hdw., cs. 12	348		

Dutch East Indies.	Quan. Value.	San Francisco.	Quan. Value.
Coal, tons 101	366		

Antwerp.	Quan. Value.	San Francisco.	Quan. Value.
Copper, cs. 40	8,750		
Hdw., cs. 15	389		

Liverpool.	Quan. Value.	San Francisco.	Quan. Value.
Mach'y, pkgs. 29	4,175		
Hdw., cs. 75	3,862		
Clocks, case 1	50		
Lamps, pkgs. 19	895		
Reservoirs, 60	402		
Brass, cs. 2	883		
Belting, cs. 4	1,265		
Sandpaper, cs. 1	142		
Metals, cs. 2	101		
Revolvers, cs. 10	6,000		
R. R. mtl., cs. 100	4,500		
Pistols, cs. 7	260		
Lead, cs. 3	73		
Wire g'ds, cs. 3	1,000		
Pumps, pkgs. 11	832		
Ag. imp., pkgs 41	1,275		
Mf. iron, pkgs. 41	1,435		
Pit'd ware, cs. 1	500		

London.	Quan. Value.	San Francisco.	Quan. Value.
Tubing, case 1	420		
Lamps, pkgs. 36	252		
Handspikes, 1040	312		
Hdw., cs. 85	2,543		
Mach'y, pkgs 53	4,070		
Sew. mach., cs. 118	2,791		
Pistols, case 1	144		
Clocks, cs. 242	4,747		
Ag. imp., pkgs. 1521	40,034		
Pit'd ware, cs. 3	100		
Pumps, pkgs. 205	1,335		

Glasgow.	Quan. Value.	San Francisco.	Quan. Value.
Clocks, bxs. 11	598		
Mach'y, pkgs. 13	823		
Wh'ls & axles 165	872		
Belting, case 1	1		
Ag. imp., pkgs 9	225		
Mf. iron, cs. 28	281		
Hdw., pkgs. 5	226		

British North American Colonies.	Quan. Value.	San Francisco.	Quan. Value.
Mf. iron, pkgs. 44	294		
Plumb. mtl., pkgs. 16	245		

British West Indies.	Quan. Value.	San Francisco.	Quan. Value.
Lp g'ds, pkgs 129	1,104		
Mach'y, pkgs. 3	115		
Crge mtl., pkgs 8	222		
Sew. mach., cs 2	55		
Ag. imp., pkgs 33	393		
Tinware, cs. 13	150		
Nails, kegs, 174	506		
Clocks, cs. 7	251		

### IMPORTS

Hardware.	Quan. Value.	San Francisco.	Quan. Value.
Soker Hermann & Co.		Pig, tons, 100	
Guns, cs. 3		Order, Pig, tons, 100	
Cutlery, cs. 2; cs. 20			

Drexel, Morgan & Co.	Quan. Value.	San Francisco.	Quan. Value.
Cases, 3			
Gill John, Cases, 2			
Hildick A. H. Cases, 3			
Chains, cs. 4			
Livinston W. & F. Millstones, 1099; cs. 30			

Lamb G. Cases, 2	Quan. Value.	San Francisco.	Quan. Value.
Mayer R. & Co. Grindstones, 36			
McCoy & Co. Mds., pkgs. 37			
Merchant Dispatch Co. Gun caps, cs. 3			
Schoverling & Daly Mds., pkgs. 1			
Ward Asinine Packages, 7			

Wiebusch & Huger Hdw. Co.	Quan. Value.	San Francisco.	Quan. Value.
Cutlery and Hdw., pkgs. 71			
Order, Arms, cs. 3			
Wire, bbls. 40			
Cases, 1			
Chains, cs. 4			
Emery stones, bxs. 2			
Packages, 86			
Per. caps, cs. 3			

Iron.	Quan. Value.	San Francisco.	Quan. Value.
Abbot J. Bars, 263			
Alexandre F. & Sons, Bars, 165			
Brown Bros. & Co. Swedish rolled bars, 60			
Currie W. F. & P. Co. Tubes, 700			
Gossler & Co. Bars, 2592			
Henderson Bros. & Co. Pig, tons, 100			
Mitander Nils, Coils, 270			
Bloomer, ps. of, 1717			
Naylor & Co. Spiegel, lots, 1			

Imports.	Quan. Value.	San Francisco.	Quan. Value.
Byrne Jos. & Co. Tin plates, bxs., 1594			
Bank of Montreal. Tin plates, bxs., 1252			
Terne pit's, bxs., 455			
Bruce & Cook. Tin plates, bxs., 101			
Roda, bbls., 45			
Cort N. L. & Co. Tin plates, bxs., 475			
Montell F. T. & Son. Copper, bbls., 1			
Brass, bbls., 5			
Lead, bbls., 1			
Pratt Chas. & Co. Bundles, 75			
Phelps, Dodge & Co. Tin pit's, bxs., 12,169			
Schneider Jos. & Co. Bundles, 57			
Wilson & Asmus. Copperore, bags, 201			
Scrap metal, bbls., 8			
Order, Black taggers, bxs., 100			
Tin plates, bxs., 3328			
Zinc plates, 1720			
Without bill of lading. Antimony, kegs, 40			

Old Metals, Paper Stock, &c.	Quan. Value.	San Francisco.	Quan. Value.
In the Old Metal market there is very little doing. There is little demand from consumers for any description of stocks, and there is no strength to prices. In the Rag and Paper Stock market, Soft Woolens is the only article which is in good request and selling at the regular market quotations. Other stocks present no material change.			

The purchasing prices offered by dealers for Old Metals are as follows:

Old Metals, Paper Stock, &c.	Quan. Value.	San Francisco.	Quan. Value.
Scrap Iron, 100			
Scrap Steel, 100			
Scrap Copper, 100			
Scrap Brass, 100			
Scrap Lead, 100			
Scrap Zinc, 100			
Scrap Tin, 100			
Scrap Nickel, 100			
Scrap Antimony, 100			
Scrap Arsenic, 100			
Scrap Bismuth, 100			
Scrap Cadmium, 100			
Scrap Cobalt, 100			
Scrap Chromium, 100			
Scrap Gold, 100			
Scrap Silver, 100			
Scrap Platinum, 100			
Scrap Palladium, 100			
Scrap Rhodium, 100			
Scrap Rhenium, 100			
Scrap Ruthenium, 100			
Scrap Selenium, 100			
Scrap Tellurium, 100			
Scrap Vanadium, 100			
Scrap Yttrium, 100			
Scrap Zirconium, 100			

Copper.	Quan. Value.	San Francisco.	Quan. Value.
Yellow Metal, 100			
Brass, heavy, 100			
Brass, light, 100			
Composition, heavy, 100			
Lead, solid, 100			
Tea Lead, 100			
Zinc, 100			
Pewter, No. 1, 100			
Pewter, No. 2, 100			
Spelter, 100			
Wrought Iron, 100			
Light do., 100			
Stove Plate, 100			
Machinery do., 100			
Grate Bars, 100			

The prices current for Rags, &c., are as follows:	Quan. Value.	San Francisco.	Quan. Value.
Canvass Linen, 100			
Cotton, No. 1, 100			
No. 2, 100			
White, No. 1, 100			
No. 2, 100			
Seconds, 100			
Mixed, Woolen, 100			
Soft, do., 100			
Gunny bagging, 100			
Waste Paper and Scraps, 100			
Kentucky bagging, 100			
Book Stock, 100			
Newspaper Stock, 100			
Waste Paper and Scraps, 100			
Kentucky Bale Rope, 100			
Oakum Junk, No. 1, 100			
No. 2, 100			
Tarred Shalings, 100			
Grass Rope, 100			

### PHILADELPHIA.

Office of The Iron Age, 220 South Fourth St., PHILADELPHIA, February 6, 1878.

Business seems to have brightened up somewhat during the past few days, and although there is nothing like activity in any department, there are tolerably clear indications that the extreme depression will soon be broken up. While the uncertainty in financial and tariff matters continues it is not likely that any marked improvement will be experienced, but inquiries and proposals for business show both the desire and necessity for purchasing many descriptions of Iron manufactures. As an evidence of this, one of the leading firms in Machine Tools informs us that they declined more business last month than in any similar period in their experience, solely on the ground that prices were too low. This, in fact, appears to be a general feeling in all departments of the Iron trade, viz., that business can be obtained at a price, but with the result of last year's operations fresh in mind there is no disposition to encourage new transactions unless at a fair margin of profit.

The tariff question is looked upon not so much with alarm as utter disgust. There is no probability of the bill being passed, but it destroys confidence, unsettles business and leads to much trouble and annoyance. A meeting of the trade is to be held here on the 12th inst. to consider what steps should be taken in the matter.

Pig Iron.—The market has assumed a healthier tone during the past week, and the general feeling is one of firmness and strength. The demand has been more active, and there are plenty of buyers at the low figures current some days back. Holders have changed their views, however, and evince no anxiety for business unless at regular market rates. The large sale of Allegheny Iron, known to be upward of 10,000 tons, made by E. J. Etting (reported from this office by telegraph on the 30th ult., but which, owing to a slight delay, was unfortunately too late for insertion), seems to have had a good effect on the trade, and the quantity offering is at present not in excess of consumptive requirements. The condition of the trade throughout appears decidedly more cheerful than on date of our last report. The reasons for this may be given as follows: 1st. A better general demand from all classes of buyers; 2d. Very little Iron offering, showing that stocks are much reduced and that a very slight increase in the demand sensibly affects prices; 3d. The certainty that present market rates are below cost of production, and 4th. That producers seem determined to secure better prices or blow out their furnaces. Business during the week has been pretty well distributed, all grades of Iron and all classes of buyers being represented. Prices obtained have been more uniform than for several weeks past, say \$18.50 @ \$19 for No. 1 Foundry Iron; \$17 @ \$17.50 for No. 2 ditto, and \$16.50 for average qualities of Gray Forge, with special brands of this grade selling as high as \$18. A much larger business might have been done if sellers had been willing to enter orders for forward delivery, but the present disposition is to confine operations to cash transactions and prompt deliveries. The future of the trade is still uncertain, however, and the movement of the past few days may after all be only temporary, in fact, some well informed parties are of opinion that it is "a little spur," to be followed by another period of dullness and depression. There appears to be some reason, however, for supposing that the reaction will be permanent and lead to slightly higher prices. Stocks are shown to be smaller by 100,000 tons than on the same date of last year (see estimates by Mr. Swank on another page), and if the signs of increasing consumption are confirmed, the improvement will, no doubt, be a genuine one. There is a good deal of confidence expressed in present values, and expectations of higher prices at some not very distant period was universal; but the unsettled condition of financial affairs, and the action of Congress in regard to the tariff, all tend in the meantime to retard any improvement which might otherwise be experienced. In the mean time we quote the market steady at the following figures: No. 1 Foundry, \$18.50 @ \$19; No. 2 Foundry, \$17 @ \$17.50; Gray Forge, \$16.50 @ \$18.

Rooms are unchanged, with sales at the following prices, according to quality: Sunken Scrap Blooms (2404 lb), \$42 @ \$45; Northern Ore Blooms (2240 lb), \$37 @ \$39; best quality Charcoal Billets (2240 lb) for wire and steel purposes, \$50 @ \$55; Bars, do., \$65 @ \$67.50; Sheet Iron Blooms, cornered (2404 lb), \$60 @ \$62.50; Cold-blast Charcoal Plate Blooms, \$55 @ \$57.50; run-out Anthracite, \$50 @ \$52.50.

Muck Bar.—Sales of small lots at the following quotations: Soapstone, \$30; Boiled on Ore, \$33; extra quality for Hoops and Rods, \$35; all Philadelphia delivery. Market quiet.

Plate and Tank Iron.—The demand during the week has been dull and disappointing. Sales confined exclusively to

small lots, at about former prices. The immediate outlook is not very encouraging, as there is nothing under way likely to require any large amount of Plate Iron in the immediate future. Shipbuilding and boiler work is less active, bridge work and the elevated railway being about the only contracts likely to cause much demand, and this we believe has been already met. We make a slight change in quotations, at which the market may be considered quiet and steady, as follows: Common Plates, 2.5¢ @ 2.4¢, with sales of 100 tons at 2.25¢; Tank Iron, 2.3¢ @ 2.5¢; C. No. 1, 2.4¢ @ 2.6¢; Shell Iron, 2.75¢ @ 2.9¢; Flange Iron, 3.85¢ @ 4.10¢; Solid Fire Box, 4.85¢ @ 5¢, and Best Bloom, 5.5¢ @ 6¢.

Sheet Iron.—The market is exceedingly dull and inanimate, as may be expected at this season of the year. Prices are steady, however, and manufacturers appear determined to obtain current rates, and all sales therefore have been on the basis of the following quotations, with the usual concessions to buyers of large lots for prompt cash. Refined Sheet Iron, No. 26 to 28, 3.6¢ @ 3.7¢; No. 22 to 24, 3.4¢ @ 3.5¢; No. 16 to 21, 3.2¢; Best Bloom Sheets, No. 26 to 28, 5.4¢ @ 5.5¢; No. 22 to 24, 5.2¢; No.



are exhaustively dealt with by the annual report of the Leeds Chamber of Commerce thus: "The arrangements with Continental nations to take the place of treaties expiring or expired progress very slowly, but there is little doubt that in some cases specific will take the place of the present *ad valorem* duties. Some compensation for this, however, is that there is little doubt the principles of free trade are progressing both in France and the United States of America, and that in the latter some concessions must be made before long to the populations of the South and West, on whom the duties on manufactured articles press heavily. Early in the year the English government entered into negotiations with that of France for a general commercial treaty, but they have since, owing to political events, suspended. It is, however, hoped that they will soon be resumed, and no doubt the new council will continue to watch the interests of this district in the matter. The



arrangements which have been for some time in operation have done much to prevent these disputes as to value which at one time so frequently occurred; and it is hoped that the success of this system will induce the French government to retain the present mode of assessing the duties by value and not by weight. The Austro-Hungarian Monarchy has conceded to us instead of a treaty containing specific stipulations and restrictions, simply the most favored nation clause. This amounts to our trade being, for the present, regulated by the Austro-Hungarian treaty with the Zollverein of March 9th, 1868. This treaty has been extended by mutual agreement until 30th June, 1878, after which date the footing we may stand on with regard to Austria is entirely uncertain. Though by the most favored nation clause already secured, our goods will not be subjected to higher duties than the products of other countries, yet a similar result may be arrived at if high duties are put upon the leading exports hence, but of which only small quantities, or none, enter Austria from other sources. The Swiss have been compelled to raise their import duties, but merely for revenue purposes, and it does not seem that the protective views so ripe in other countries have found much favor there. In Spain, on the contrary, not only has a revised tariff been promulgated with duties on a highly protective scale, but a difference is made between various nations; and England, as compared with Germany, Switzerland and other favored nations, is put at a great disadvantage. The Italian treaty is once more renewed temporarily, this time for only three months, or until 31st March, 1878, after which it may be again renewed, or specific duties may at once come into force. The uncertainty into which British exporters are thrown by this unsettled state of affairs, especially with regard to Austria and Italy, is almost as detrimental to trade as if higher duties were definitely resolved upon. The time for which the existing state of things is prolonged is too short to make the usual arrangements for manufacturing, selling and delivering goods.

**SCOTCH PIG IRON**  
has been fairly steady during the week and prices have not experienced any further mentionable retrogression. There are now 169,631 tons of pig in Connal's stores—an increase of 769 tons. Ballast pig is 43/6 per ton. Last week's imports from Middlesbrough reached 3970 tons, as against 7685 tons in the same week of 1877. Writing from Glasgow, Jan. 19, James Watson & Co. said: "The Scotch pig iron market has been very steady this week with little variation in the price. On Monday the opening figure was 50/8, improving to 50/9 1/2; on Tuesday the market was quiet at 50/9 1/2 and 50/9 cash; on Wednesday morning 5000 tons were sold by auction, the iron being eagerly purchased at 50/9 to 50/10 per ton, afterward a good business was done at 50/9 cash. Yesterday the market was steady at 50/9 to 50/10, whilst to-day business has been done from 50/9 to 50/10 1/2 cash, closing buyers at 50/10, sellers 50/10 1/2." Shipments last week were 6085 tons against 6501 tons in the corresponding week of 1877. We quote:

	No. 1.	No. 2.
G. M. B., at Glasgow	52/6	53/6
Cartierrie	52/6	53/6
Coltness	52/6	53/6
Summerlee	52/6	53/6
Langloan	52/6	53/6
Cambridge	52/6	53/6
Calder, at Port Dundas	52/6	53/6
Glenarnock, at Ardrossan	52/6	53/6
Eglington	52/6	53/6
Dalmellington	52/6	53/6
Shotts, at Leth	52/6	53/6
Kinnell, at Bo'ness	52/6	53/6

Messrs. John E. Swan & Bros. (Limited) quote No. 1 brands:

Cartierrie	50/
Coltness	50/
Glenarnock	50/
Eglington	50/

The prices of Wm. Colvin & Co. are similar to these.

Included in last week's shipments from the Clyde were locomotive engines and tenders, £27,200; steam crane, £600; bridge work, £900, and railway sleepers, £13,000 for Bombay; £7,100 machinery for Calcutta and New Zealand; £15,500 castings, £600 pipes and tubes, £940 sewing machines, £3,900 miscellaneous.

**TRADES OF SHEFFIELD.**  
In the iron trade proper the changes of the week have not been numerous, nor have they been of any particular importance. At the Sheepbridge Works considerable rearrangements of wages and the number of men have been effected, and I hear that some, if not all, the men employed by Samuel Fox & Co., Limited, Stocksbridge, have accepted a reduction equal to about 4d. a day. The men in the file trade are resolutely resisting the attempted drop by one house, and during the past week no fewer than 600 new members have rallied to the union ranks.

For some weeks past there have been rumors in circulation relative to the Albion Steel and Wire Works, Sheffield, which have been closed for some time, owing to the winding up of that company. It is now stated that the works are likely to be leased by the Telegraph Construction and Maintenance Company, of London, which was one of the best customers of the Albion Company. It is reported that the arrangements are for a two years' lease, with the option of purchase at the termination of that period.

The Stanton Iron Works, Derbyshire, have been acquired by a company with a capital of £600,000 in £100 shares, of which Mr. J. S. Crompton, of Derby, holds 1000, and Mr. George Crompton, of Chesterfield, 1000. The properties included in the transfer are the Stanton Iron Works and the Dale Colliery, Stanton and Ilkeston; the Tversall Collieries, Nottingham; the Pleasley Colliery, Derby; the Desborough Iron Ore Works, Northampton; and the ironstone mines, Northampton.

The coal market remains in a very quiet state, although there is certainly a considerable sale of fuel just now. Prices, however, are very low all round, and colliery owners as well as merchants complain strongly of their inability to obtain more than the most meager profits. No action has as yet been taken in respect of the wages question, but the associated coal owners are not unlikely to consider the matter afresh in the course of the next month or six weeks. The

dispute at Manver's Main Colliery has now been referred to arbitration.

In speaking at Penistone the other night Mr. George Wilson, managing director of Charles Cammell & Co., alluded to the dissatisfaction that exists in the heavy trades of the district by reason of the great charges that are imposed by the railway companies on all goods of that class that are manufactured in the neighborhood of Sheffield. These charges, he said, were more per ton than in any other part of the country, and twice or thrice as much as on the Continent. The matter, however, would be brought before the companies, and if they would only meet the manufacturers in the spirit they usually did, he had no doubt an additional stimulus would be given to the steel trade of the district. I may add that the steel rate from Sheffield to Liverpool was formerly 20/ per ton, but was three or four years ago lowered to 12/6, at which it now remains. To Hull the rate for rails is about 8/ by rail, and only 4/6 by canal. One would suppose, taking the respective mileages into consideration, that if Hull is only 8/ by rail, Liverpool might very readily be brought down to 7/6 or 8/6. More will probably be heard of this matter shortly.

In cutlery there is a fair amount of work doing, chiefly on account of best table knives. A good deal of German cheap cutlery continues to be "factored" by Sheffield merchants.

**STAFFORDSHIRE AND BIRMINGHAM.**  
In connection with the iron trade of these districts, some rather peculiar facts have transpired. Mr. Firmstone (alluded to in a previous paragraph) who had six furnaces in blast has only one now working, and has stopped his Hyde and Crookhay Iron Works. Latterly, he says, he had been losing £100 a week by the former works, where he made wire iron, and had lost £1. 5/ @ £1. 10/ per ton upon every ton he had sold for 12 months, owing, I presume, to the low offers of the Belgian and German agents. His men had offered to accept a reduction of 6d. per ton on puddling and 5/ on mill work, but he would not consent to reopen on such terms. These facts alone show how the Staffordshire iron trade has of late been "slaughtered." At present all transactions are on a very limited scale, few of the mills or forges being able to be kept going over half time. Prices, as frequently quoted by me of late, are purely nominal all round, at £8 @ £3. 10/ for best bars and £6 common. In hardware actual transactions and future prospects are rather brighter than in respect of iron, although merchants are ordering very cautiously and in small lots. With India a good general trade is being done, especially as regards edge tools, cultivating implements and machinery. From the Argentine Republic fairly good indents are coming to hand, and from our leading antipodean colonies the orders are of very respectable size. From New Brunswick, Canada and even from the United States the current inquiries are more encouraging. Generally speaking, the edge tool manufacturers are well employed on South American, West Indian, &c., orders for ordinary tools, as well as hoes, picks and machetes. In and near Dudley several large orders for spades and shovels have recently been placed. In railway lamps, ironwork, axles, springs, &c., there is very little doing, and the jewelry branches are very quiet. For metallic bedsteads the only inquiry appears to be that emanating from the Spanish West Indies and Australia. The chain makers are regularly employed for the most part, and spoons, forks, &c., are selling with moderate freedom. Brass founders are running short of orders, despite lower quotations. Nickel and German silver goods are declared down 2 1/2 @ 5 %, as are wrought iron hinges, chest handles, kettle cars, latches, small chains and other minor goods.

**SOUTH WALES AND MONMOUTHSHIRE**  
are exceedingly barren of interest just now, save in respect of the painful attention which is still centered upon them by reason of the existing distress. Only a few hundred tons of rails were shipped last week, although Dowlais is fairly engaged and some little work in hand at Ebbw Vale and Panteg. A further issue of 6 % debentures is now being made by the Rhymney Iron Company, the £36,000 to be thus raised being intended for the development of the Bessemer plant. The coal shipments last week reached 36,000 tons.

**THE METAL MARKETS**  
have again ruled quiet and values have not greatly altered.

Messrs. Von Dadelzen & North say: "Copper has been steady. Chili bars rather dearer, £65. 10/ @ £66 for spot parcels. Business done at £65. 10/ for G. O. B., two months fixed, and at £66. 5/ for Urmeneta and Lota, to arrive. Wallaroo quoted £75. 10/ @ £76. Burra sold at £74. We quote English tough, £69. 10/ @ £71; select, £71. 10/ @ £72. 10/; strong sheets, £76 @ £77. Some India sheets sold at £75 @ £74. 10/; Chili charters, 2000 tons. Tin has been steady, with a moderate business in both Straits and Australian, on the spot, at £64 @ £64. 5/. English ingots easier, and quoted £68 @ £70. Banca, in Holland, 40ff.; Billiton, 30 1/2 ff. Tin Plates, unchanged. Lead, dull; English pig, £19; and soft Spanish, without silver, £18. 17/6. Spelter, dull; £18. 15/ @ £19 for ordinary brands. Quick-silver, firm at £7. 5/; fair business doing. Antimony.—English star, £51; Australian, £49 @ £50."

The Mining Journal remarks: "Copper.—Our market has been fluctuating, and there has been no dependence upon quotations. The Liverpool reports have given much support to prices, but although a good business has almost daily been recorded from there, and prices occasionally enhanced, especially for the best brands, yet the impression made upon buyers here is trifling, and during the last day or two there has been manifest weakness, but this has more particularly been attributed to the receipt of unfavorable telegraphic advices from Valparaiso. Chili bars for the most part have been quoted between £65. 10/ @ £66 for G. O. B.'s. Tin.—The market has not undergone more than a trifling change, the value of Australian and Straits ruling between £64 @ £64. 5/ for cash. There has been no disposition to press sales, neither has there been any eagerness to buy; the quantity coming forward is ample for all

requirements, and with the large stock still existing it will be difficult to advance the market. Lead.—There has been no movement in this market and prices are unaltered. Tin Plates.—Our market is steady, but there is not much doing, limits being below makers' prices. The New York market is inactive, and the demand continues on a very light scale, but no change has been made in prices. Spelter.—Quotations for Silesian 2/6 lower. Supplies come forward freely and their appears no present prospect of a change. Steel.—There is no particular feature affecting this metal, and prices of both English and foreign are easy. To-day's London official opening prices are: Charters for the first half of January are telegraphed as 2000 tons; market steady; G. O. B. Chili bars, £65. 10/ @ £66 spot and forward; Wallaroo, £75. 10/ @ £76. 15/; Burra, £74. English tough, £69. 10/ @ £71; best selected, £72 @ £73. 10/; strong sheets, £76 @ £77. Tin dull, with transactions on the spot in Straits and Australian at £63. 15/ @ £64 paid for forward; English ingots, £68 @ £69. Lead quiet; English pig, £18. 17/6 @ £19; soft Spanish without silver, £18. 17/6. Spelter.—£18. 17/6 @ £19 for ordinary brands. Quick-silver.—£7. 5/ for Spanish. Antimony.—£51 for English star.

#### Relative Increase of Gold and Silver.

The San Francisco Commercial Herald says: At this time, when the status which gold and silver are to occupy in the currencies of the world is being so much discussed, it may be worth while to ascertain as nearly as may be the rate at which these metals have been and are hereafter likely to be produced, as their relative increase must have much to do with the determination of this problem. From the discovery of gold in California in 1848 till the date of active bullion production on the Comstock lode in 1861, there was turned out in our Pacific States and Territories, including some small lots received from British Columbia and Northwestern Mexico, gold to the value of \$700,000,000, the silver product of these regions having meantime amounted to very little. Since, and including the year 1861, the production of gold for the entire coast has been \$376,000,000; silver, \$372,000,000. The disproportion here shown between the yield of the two metals has been every year diminishing until it has now become almost equalized, the bullion made last year having consisted of about \$51,000,000 gold and \$49,000,000 silver, a ratio of production that will be likely to hold without much variation in the future.

While it is true that more silver than gold bearing mines are being discovered and developed into productive properties, it is still the case that the percentage of gold contained in many of the lodes opened up so increases with depth that this becomes at last the predominant metal. Such has been the history of all the ore bodies on the Comstock that have held to great depths. Of the \$36,000,000 turned out by that lode in 1877, 43 per cent. has been gold. The ores of the California mine, taken from a depth of 1500 feet, have yielded during the past year about equal parts of gold and silver, the latter metal having been slightly in excess in the ores of the Consolidated Virginia mine, adjoining the California on the south. In another year it is probable that the value of the gold will equal, if it does not exceed, that of the silver taken from both these mines. Of the base bullion made in Eureka district last year—valued at \$12,000,000—over 16 per cent. was gold, this being about the rate at which this metal occurs in the Bullion sent from the other mines in the State of Nevada, excepting those on the Comstock range. Taken as a whole, the bullion from that State carries not far from 40 per cent. of gold. Idaho and Montana, which in the past have been mainly gold producing, have latterly begun to turn out a considerable percentage of silver, and it will not be long till the bullion from these territories will contain 30 or 40 per cent. of this metal—a condition of things that will be nearly reversed in Wyoming, Colorado, New Mexico, and Arizona. Utah bullion will be apt to consist, as heretofore, almost wholly of silver, while that made in California, Oregon, Washington Territory, British Columbia, and Dakota will contain from 80 to 90 per cent. of gold. The opening up of a series of what promise to be very prolific gold bearing veins in Mono county, California, may be expected to offset the prospective flow of bullion from the argentiferous deposits of Alpine, Inyo, and other districts in that quarter of the State.

In California the business of mining for the precious metals has been attended during the year just closed with very uneven results.

#### American Dredge for Nicaragua.

The American Dredging Co. have built a dredge for the government of Nicaragua, which is to be shipped in parts for erection at Greytown. It is a dipper dredge, with bucket of one cubic yard capacity. The hull is of 5-16-inch plate iron, 60 feet long and 22 feet wide, with 5 feet depth of hold. It has double cylinder engines 6 by 15 inches, and locomotive tubular boiler 2 feet wide, 11 feet 6 inches long and 4 feet high, constructed for burning wood. The contract was made between Alex. J. Cothead, Consul General of the Nicaraguan government, and the American Dredging Co.

Plates, with rivets, &c., for hull, engines, boiler, bucket, woodwork for deck and house, iron crane (a new feature), spuds, &c., comprising the entire material for constructing a first-class dredging machine, were shipped on the schooner F. B. Colton, Nov. 14, 1877, for San Juan del Norte (or Greytown), from the company's works at the foot of Spruce street, Camden, N. J. The schooner also took out a force of skilled workmen, in charge of Mr. James W. Pennypacker, and arrived at her destination Dec. 16, 1877, when the work of erecting the machine was immediately commenced. This is under the direct supervision of A. G. Menocal, C. E. The dredge referred to above is the second sent to South America by the American Dredging Co., and embodies all of the latest improvements in dredging machinery.

## Metropolitan Washing Machine Co.,

32 Cortlandt Street, New York.

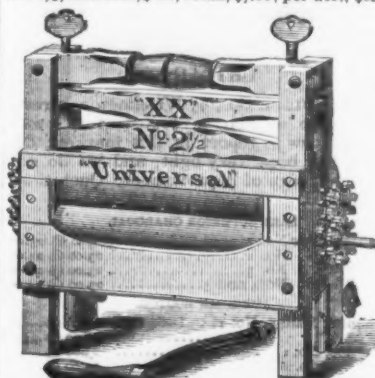
Wholesale Price List of

## Universal and National CLOTHES WRINGERS, AND Doty's Washing Machine.

February 2d, 1878.

### UNIVERSAL, No. 2 1/2.

FAMILY SIZE (USUAL).  
PRICES.  
No. 2 1/2, Roll 10x1 1/2 in., retail, \$7.50; per doz., \$60.00



With Folding Clothes Guide, two Pressure Screws, Wood and Rubber Springs, Malleable Iron Work.  
The Nos. 2 1/2 and 2 differ only in diameter of roll. The former is more generally purchased on account of lower price. Both are furnished as may be ordered, with usual Clamp for Round Tubs, or with "Swing Clamp" wide enough for either Stationary or Round Tub.

### NATIONAL, No. 2.

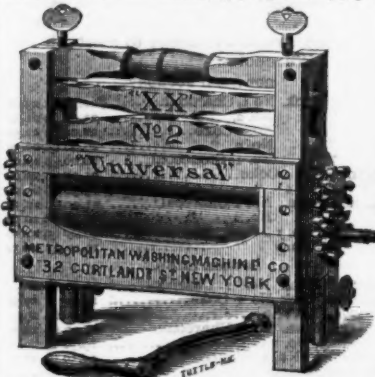
PRICES.  
No. 2, Roll 10x1 1/2 in., retail, \$6.50; per doz., \$50.00  
No. 2 1/2, " " " " " " 7.50 " 63.00  
No. 1 1/2, " " " " " " 8.50 " 71.00



Has Rowell's Cog-Wheels on both ends, Galvanized Malleable Iron Frame, two Pressure Screws, and Folding Clothes Guide.  
Can neither Break, Rot nor Rust.

### UNIVERSAL, No. 2.

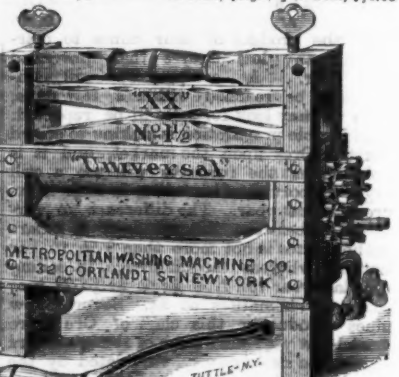
FAMILY SIZE (MEDIUM).  
Rolls 10x1 1/2 in. .... Retail, \$7.50; per doz., \$60.00



With Rowell's Cog-Wheels on both ends, Folding Clothes Guide, two Pressure Screws, Wood and Rubber Springs, Malleable Iron Work.  
The same as No. 2 1/2, only in diameter of roll, which, being larger, costs more and wrings large articles more evenly.

### UNIVERSAL, No. 1 1/2.

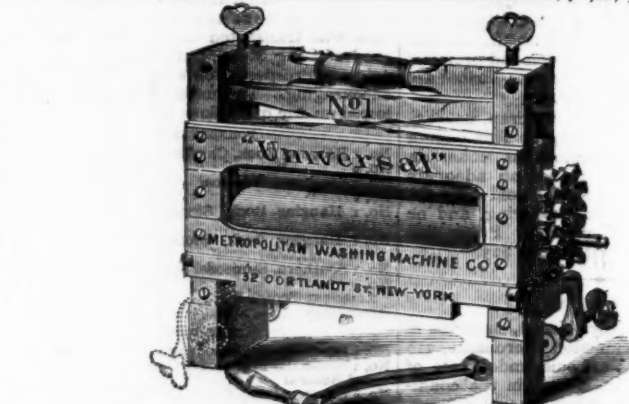
FAMILY SIZE (LARGE).  
Rolls 11x1 1/2 in. .... Retail, \$8.50; per doz., \$71.00



Rowell's Cog-Wheels on both ends, Swivel Clamps, Fits Round or Set Tubs.  
This size having longer Rolls and greater capacity than No. 2, wrings large articles with greater ease, and with less strain on the machine.

### UNIVERSAL, No. 1.

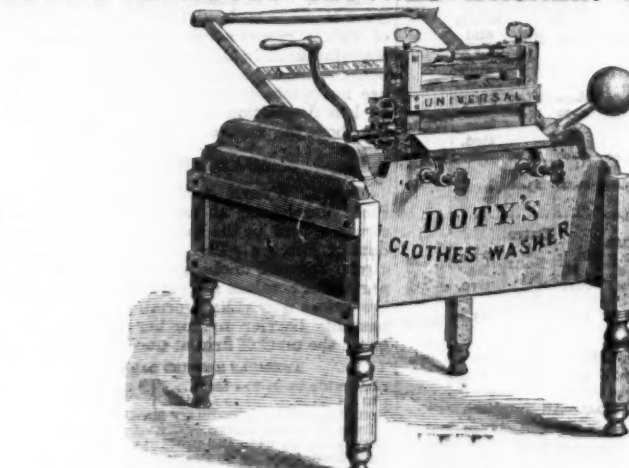
PRICES.—No. 1, Rolls 12x2 in. .... Retail, \$12.00; per doz., \$93.00



The Best Set-Tub Wringer ever made. Swivel Clamps, arranged to swing either way. Wrings backward and forward from either side.

In addition to the above we furnish four large sizes for use in Factories, Sugar Houses, Laundries, &c., to run by hand or power.  
No. 3, Rolls 14 by 2 1/2, Retail, \$16; Wholesale, each, \$12 | No. 4, Rolls 17 by 3 1/2, Retail, \$25; Wholesale, each, \$19  
No. 5, " " " " " " 35 | No. 6, " " " " " " 45

**DOTY'S IMPROVED CLOTHES WASHER.**—Over 72,000 sold.



With the Metropolitan Balance Weight.  
Over Seventy Thousand families in the United States are now using the DOTY WASHING MACHINE with perfect success. There is no mistake about it; this machine will wash clothes well and thoroughly, much faster and easier than can be done by hand, and with far less wear to the garments. It saves its cost every Year by Saving the Clothes.  
PRICES.—FAMILY SIZE, Retail, \$14; Wholesale, \$9.50. HOTEL SIZE, Retail, \$16; Wholesale, \$10.50



# HOBART'S TACKS

MANUFACTURED BY  
DUNBAR, HOBART & WHIDDEN,  
ESTABLISHED 1810.

Office and Salesroom, 116 Chambers Street, New York. . . . Factory, South Abington, Mass.

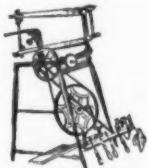


Any Kind of Wire Nails made to order from Description, or Samples.

## American and Swedes Iron Tacks,

Tinned, Leathered and Large Head Carpet Tacks, Finishing Nails, Black and Tinned Trunk Nails, Miners' Copper, Gimp, Lace and Brush Tacks, Hungarian, Chair, Cigar Box and Barrel Nails, Glaziers' Points, Iron, Steel, Copper and Zinc Shoe Nails, Patent Improved Brass Shoe Nails, Heel and Toe Plates, Steel Shanks, and Fancy Head Nails, Silver or Japanned Lining and Saddle Nails.

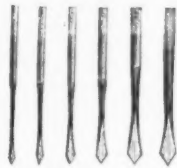
A full assortment always on hand at salesrooms, for immediate delivery if required. Odd and Irregular Sizes made to order or cut from sample at short notice. Send for Price List.



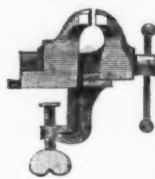
No. 1.



No. 2.



No. 3.



No. 4.



No. 5.



No. 7.



No. 8.



No. 9.



No. 10.

The demand for Bracket Saws and Materials has sprung up within the past three years, and it is now so large that many Hardware Dealers who keep the goods are doing a lively business in what is usually the dull season of the year. Our goods have been so thoroughly advertised that some of them are wanted in almost every town in the United States. We believe there is not an instance where the demand has not steadily increased when once the goods have been introduced. In selling 200,000 Saw Frames we have not heard of one complaint, but where one is in use more are wanted.

We sell all kinds of Wood, Tools and Designs. The following are the retail prices of the articles shown in the surrounding cuts. Dealers who order before sending for price list and discount sheet will in all cases get best rates.

### MILLERS FALLS CO., 74 Chambers St., New York.

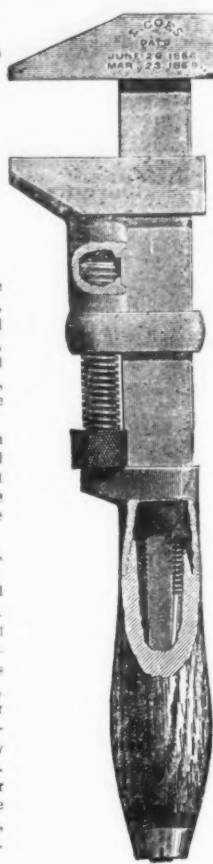
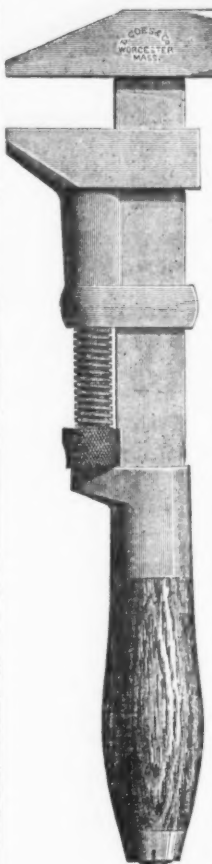
- No. 1.—Lester Saw, embracing Scroll Saw, Circular Saw, Turning Lathe, Drilling Attachment, Set of Six Drills and Three Turning Tools, Wrench, Screw Driver, &c., &c. \$8.00
- No. 2.—A Box containing Steel Saw, Frame, Three Sheets Designs, Six Saw Blades, Impression Paper, Awl, &c. 1.25
- No. 3.—Card of Drill Points, 6 in number. .25
- No. 4.—Steel Jaw Parallel Vice: 1 1/2 inch Jaw, \$2.00; 1 3/4 inch Jaw, 2.25
- No. 5.—Tool Holder containing twenty Cast Steel Tools. 1.00
- No. 6.—Adjustable Chuck Hand Drill, with six Drill Points. No. 1, \$1.25; No. 2, 2.50
- No. 7.—Set Best Steel Carving Tools in a Box. 1.00
- No. 8.—Bow Drill, with six Drill Points. .60
- No. 9.—Tool Chest, with thirty-two Tools, No. 1, \$3.50; No. 2, with 18 Tools. 1.60
- No. 10.—Saw Blades, 0 to 4, per gross, \$1.20; 4 to 7, per gross. 2.00

# L. COES' SCREW WRENCHES.

Genuine Improved Patent

Manufactured by

L. COES & CO.,  
Worcester, Mass.



We invite the particular attention of the trade to our New Straight Bar Wrench, widened, full size of the larger part of the so called "reinforced or jog bar." Also our enlarged jaw, made with ribs on the inside, having a full bearing on the front of bar (see sectional view), making the jaw fully equal to any strain the bar may be subjected to.

These recent improvements in combination with the nut inside the ferrule firmly screwed up flush against square, solid bearings (that cannot be forced out of place by use), verifies our claim that we are manufacturing the strongest Wrench in the market.

We would also call attention to the fact, that in 1869 we made several important improvements (secured by patents), on the old wrench previously manufactured by L. & A. G. Coes, which were at once closely imitated and sold as the Genuine Wrench by certain parties who seem to rely upon our improvements to keep up their reputation as manufacturers, and although the fact of their imitating our goods may be good evidence that we manufacture a superior Wrench, we wish the trade may not be deceived on the question of originality. Trusting the trade will fully appreciate our recent efforts, both in improvements on the Wrench and in the adoption of a Trade Mark, we would caution them against imitations. None genuine unless stamped

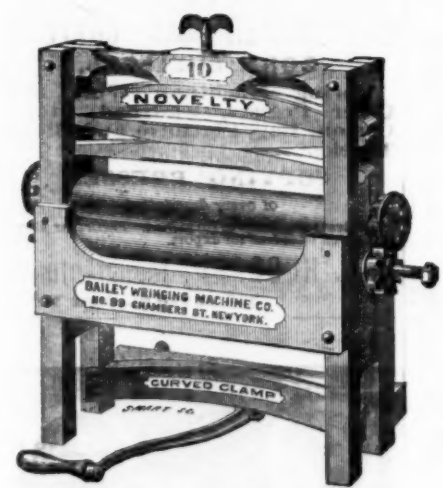
"L. COES & CO."

Warehouse, 97 Chambers St., & 81 Reade St., N. Y.  
HORACE DURRIE & CO., Sole Agents.



# NOVELTY AND EXCELSIOR CLOTHES WRINGERS, For Home and Export Trade.

SEND FOR FULL DESCRIPTIVE CATALOGUE AND PRICE LIST.



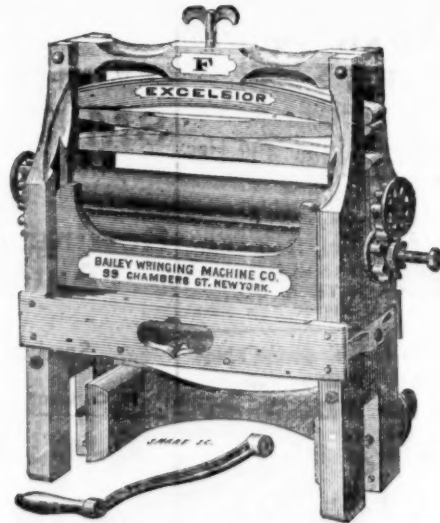
NOVELTY (with Wood Spring),

having Patent Flange Cog Wheels on both ends of the rolls; a New Crank Fastening; an Improved Water Board to prevent slopping; one Long Pressure Screw; the Patent Grasshopper Spring, which gives great capacity when large articles are wrung; and the Curved Clamp for fastening the Wringer to the tub.



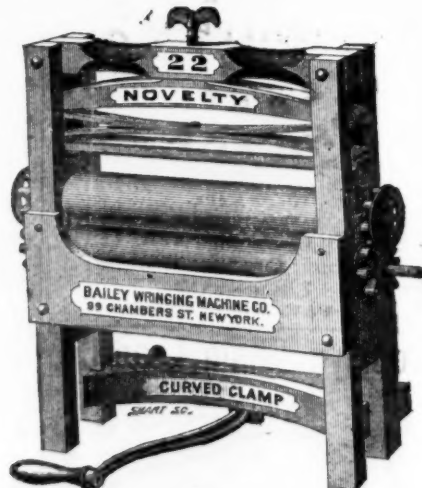
EXCELSIOR (with Folding Bench).

Making the most practical and complete Wringer for round tubs, into or from either of which the clothes can be wrung by means of the Patent Tipping Water Board, thus saving the time and labor of changing a Wringer from one tub to another, and avoiding any liability of injuring or upsetting the tubs.



EXCELSIOR (for Stationary Tubs).

The only Wringer especially adapted to and practical for use on set tubs, such as are mostly used in cities. By means of the Patent Tipping Water Board the clothes can be wrung from either division in the set tub, obviating the necessity of shifting a Wringer from one partition in the tub to another.



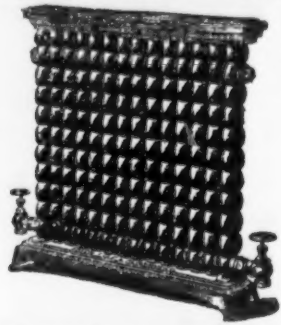
NOVELTY (with Steel Spring),

having Rolls of Large Diameter, giving greater speed, elasticity and durability; a Tempered Steel Spring, which is so shaped that it will withstand a very heavy pressure in wringing small articles, and yet has its full capacity in wringing large articles; an Extra Long Crank, by which power is gained without the loss of speed.

BAILEY WRINGING MACHINE CO., 99 Chambers St., New York.



## SNOW'S PATENT CAST IRON RADIATOR.



The only Perfect Circulating Radiator in the market.  
Address the manufacturers,

EATON, COLE & BURNHAM CO.,  
55 John St., New York,  
or Thomas Hart, 712 Filbert St., Philadelphia, Pa.

## NATIONAL TUBE WORKS CO.,

BOSTON MASS., and McKEESPORT, PENN.

## Wrought Iron Boiler Tubes,

STEAM AND GAS PIPE, ENAMELED WATER PIPE.

## Wrought Iron Railroad Cars,

Saving of 25 per cent. dead weight, and increase of 50 per cent. in strength.

MACK'S PATENT INJECTOR, MOONEY'S PATENT VALVE.

All our Manufactures Warranted.

## PEET VALVE CO.,

Manufacturers of Patent

Straight Way Valves

FOR

STEAM, WATER, GAS, &c.

152 Hampden St., Boston, Mass.

G. T. HILL, Jr., Treas.

R. H. SPAFFORD, Supt.

Send for Circular.

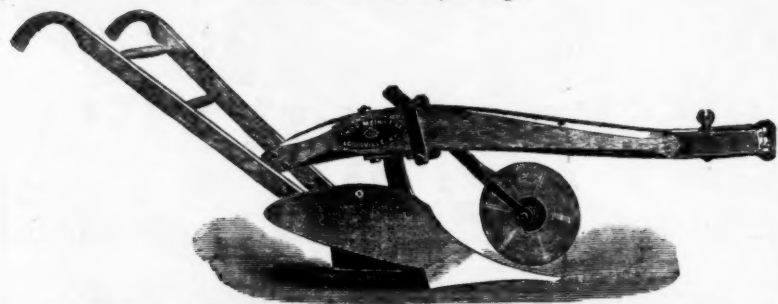
THOS. MEIKLE.

HARRY COLEMAN,

Late Vice-President Louisville Rolling Mill Co.

## THOS. MEIKLE &amp; CO.

Louisville, Ky.



## STEEL AND CAST PLOWS.

Send for Illustrated Catalogue.

## John T. Lewis &amp; Bros.,

No. 231 South Front St.,  
PHILADELPHIA.



TRADE MARK.  
MANUFACTURERS OF  
PURE WHITE LEAD, RED LEAD,  
Litharge, Orange Mineral,  
Linseed Oil  
AND PAINTERS' COLORS.

## Brooklyn White Lead Co.



White Lead, Red Lead and  
Litharge.  
89 Maiden Lane, NEW YORK.  
FISHER HOWE, Treas.



TRADE MARK  
The Atlantic White Lead and Lin-  
seed Oil Company,

MANUFACTURERS OF  
White Lead (Atlantic), Red Lead,  
Litharge & Linseed Oil.  
ROBERT COLGATE & CO.,  
287 Pearl Street, New York.

## JOHN JEWETT &amp; SONS,

Manufacturers of the well known Brand of

WHITE LEAD.



TRADE MARK.  
Also Manufacturers of  
LINSEED OIL  
182 Front Street, NEW YORK.

## McNab &amp; Harlin Mfg. Co.,

MANUFACTURERS OF

## BRASS COCKS AND VALVES

For STEAM,

WATER

and GAS.

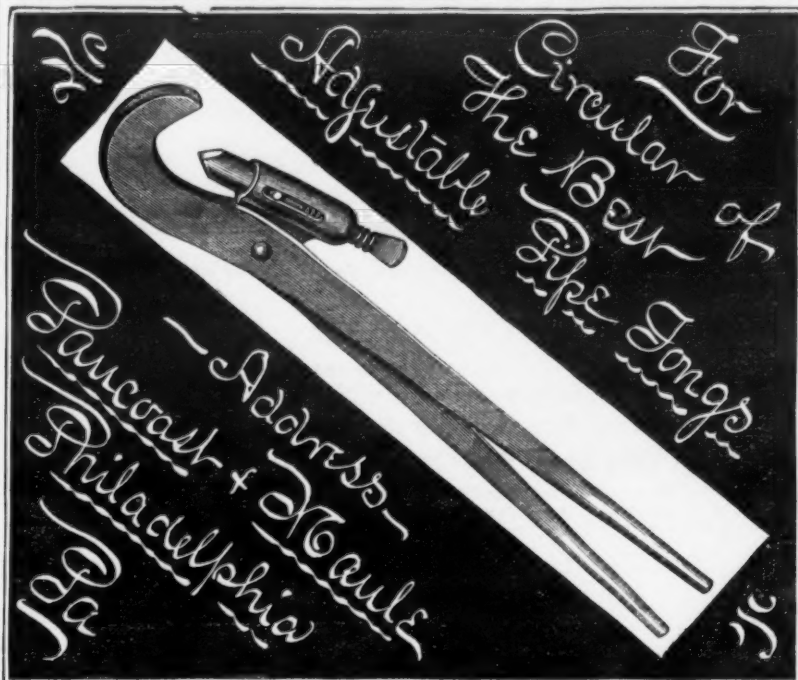
Iron Pipe and Fittings, Plain and Galvanized.

## PLUMBERS' MATERIALS.

New Illustrated Catalogue and Price list sent by express to the Trade on application.

Factory, Paterson, N. J.

56 John Street N. Y.



## SABIN'S LEVER DOOR SPRING.

Patented in the U. S.  
Feb. 1, 1876, and Aug. 1, 1876.



## Sabin Mfg. Co.

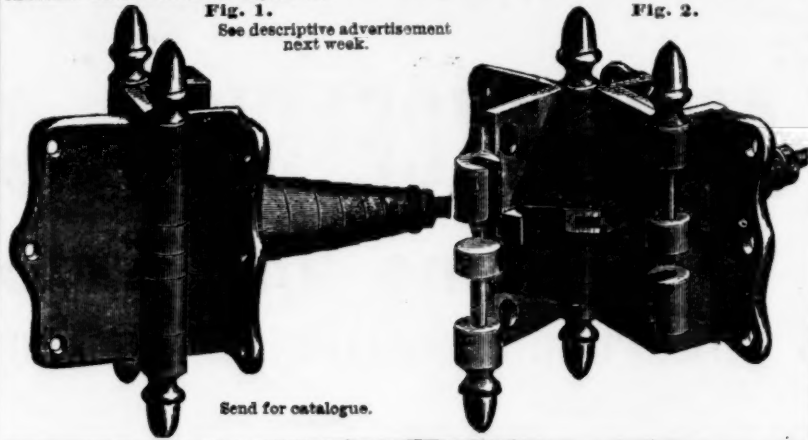
MONTPELIER, VT.

The most efficient and simple Door Spring ever made. Will readily close the heaviest outside doors, as we get the maximum pressure upon the door when closed, and a constantly decreasing pressure as the door is opened. The tension of the spring is readily adjusted to any power required, and there is no attachment of any kind to the door. Are specially adapted for railroad depots, offices, stores and public buildings, as they can instantly be made inoperative if desired, without detaching any part of it. No chains or straps to break or wear out. We use a long coiled spring made of the best cast steel, and tempered, and are practically indestructible. Send for circular and price list.

Fig. 1.

See descriptive advertisement next week.

Fig. 2.



Send for catalogue.

F. W. SMITH, President.

WARREN H. DAY, Sec'y and Treas.

## SMITH &amp; EGGE MFG. CO.,

MANUFACTURERS OF

Government and Giant Padlocks,

Sewing Machine Locks,

Automatically Made Sash Chains,

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Specialties in Hardware and Light Metallic Goods generally.

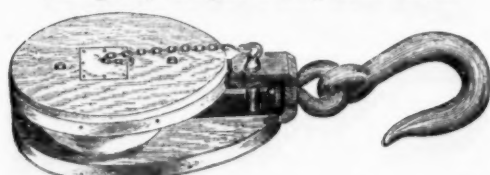
SPECIAL LOCK COMBINATIONS.

P. O. Lock Box No. 105.

BRIDGEPORT, CONN.

## The Penfield Block Works,

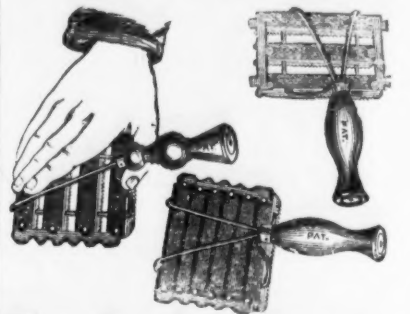
Lockport, Niagara Co., New York.



## PATENT SNATCH BLOCK.

Patented December, 1877.

Just the Block required for all tube wells.  
Furnished with any kind of Sheave or Bushing.  
Send for samples and prices.



## The Perfect Comb.

We call your attention specially to our new patent end-less wire frame comb. The result of a long series of experiments, made with a view to meeting all the requirements of a Perfect Comb. It is better, stronger, and more durable than any ever before invented. The raised wire shank gives what has never before been attained, viz: a rest and brace for the thumb, in such a position that the hand cannot come in contact with the horse while using the comb. The wire braces which run from the shank over the back to the front teeth give strength and durability in a direction never heretofore attained, and at the same time serve as an extra handle; and when clasped by the fingers in connection with the raised shank the comb is more firmly, easily, and completely held, and with much less fatigue to the hand than is possible in any other formation—in short, it needs but a trial to vindicate its name: The Perfect Comb.

## THE LAWRENCE COMB CO.

Factory and Office,

382 2d Ave., cor. 22d St., N. Y.

## WM. S. CARR &amp; CO.

Sole Manufacture of

CARR'S

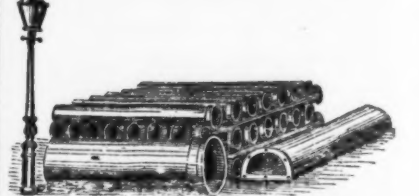
PATENT

Water

Closets,

PUMPS, CABINET WOOD WORK, &c.

106, 108 & 110 Centre Street,  
Factory, Mott Haven, NEW YORK.



## R. D. WOOD &amp; CO.,

Philadelphia,

Manufacturers of

## Cast Iron Pipe

FOR WATER AND GAS.

Lamp Posts, Valves, &c.,

Mathew's Pat. Anti-Freezing Hydrants.

400 CHESTNUT STREET.

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Manufacturers of

Wheelbarrows and Trucks.

so different styles. Good goods at low prices. Send for illustrated circular.

## W. S. ESTEY,

Manufacturer and Dealer in

Wire Cloths, Wire Goods and Wire

WORK of every description.

Galvanized Twist Netting for Fencing, Henneries, &c. Foundry Riddles and Steel Casting Brushes.

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WIRE WORKERS.

Wire Cloths, Foundry Riddles, Coa Screens, Nettings, Sparkers Cloths, Iron Railings, Window Guards, Patent Barrel Coal Sieves, Rat Traps, and every description of Wire Work made to order.

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HIDE ROLLER HAY CUTTERS,

CORN SHELLERS,

Boring Machines, Wine and

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Cotton, Bag, Platform and Block

Trucks.

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of every description.

Illustrated catalogues furnished. Particular attention given to orders for export.

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BURR & CO.,

Manufacturers of Waterman and Russell's

Patent Iron Strapped Blocks,

ALSO, MANUFACTURERS OF

ROPE STRAPPED BLOCKS.

11 PECK SLIP, NEW YORK.



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and Index to Advertisements.

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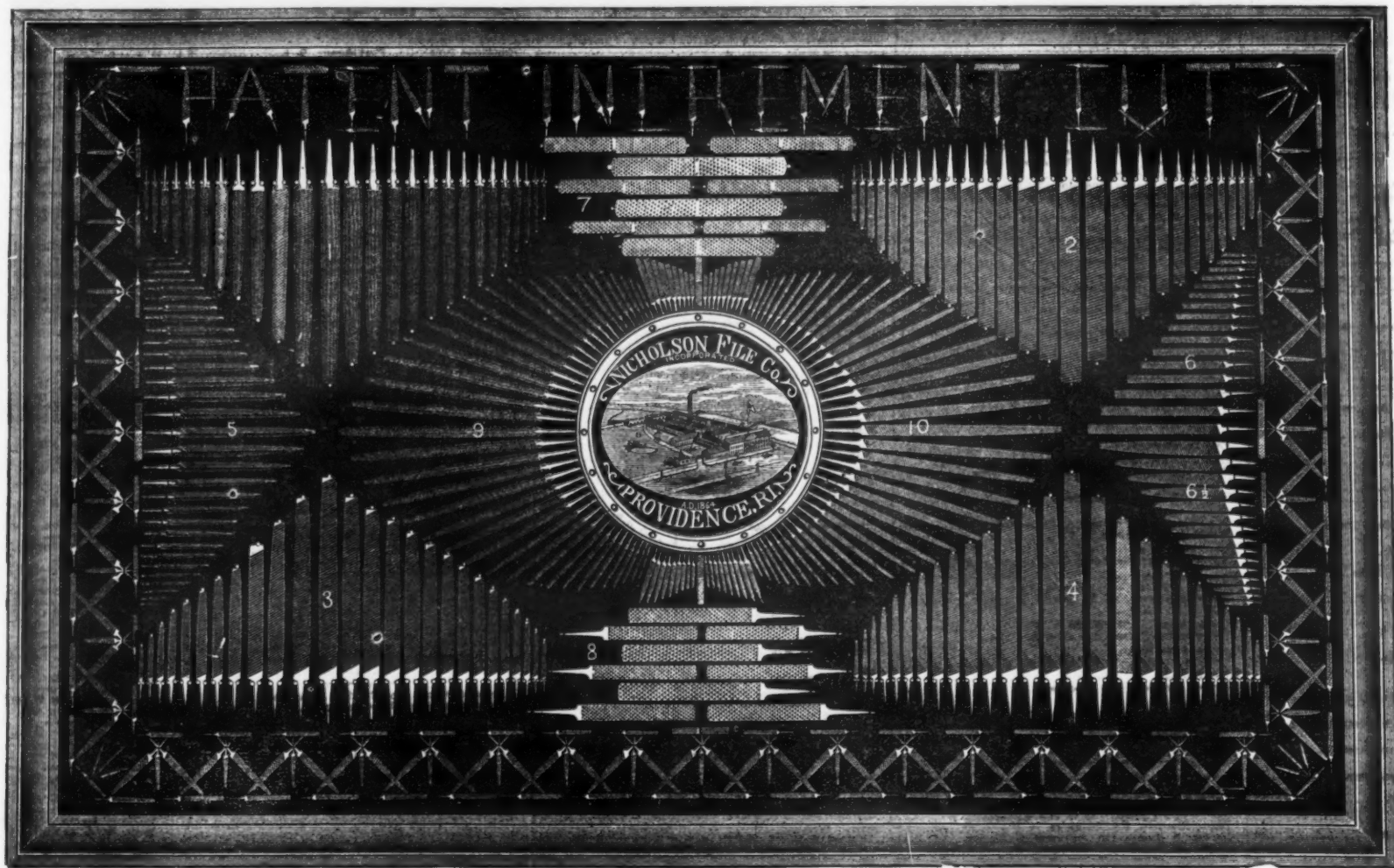
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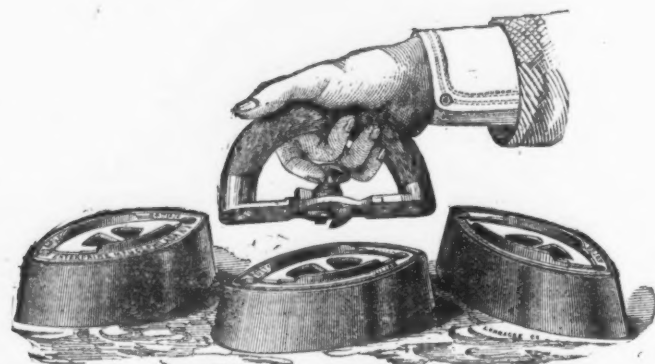
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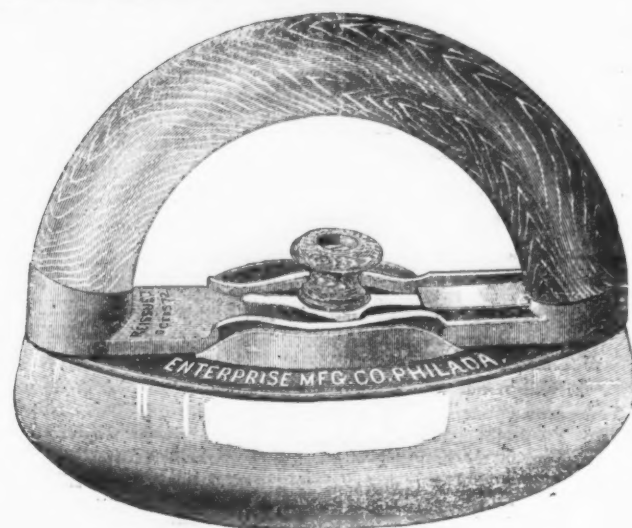
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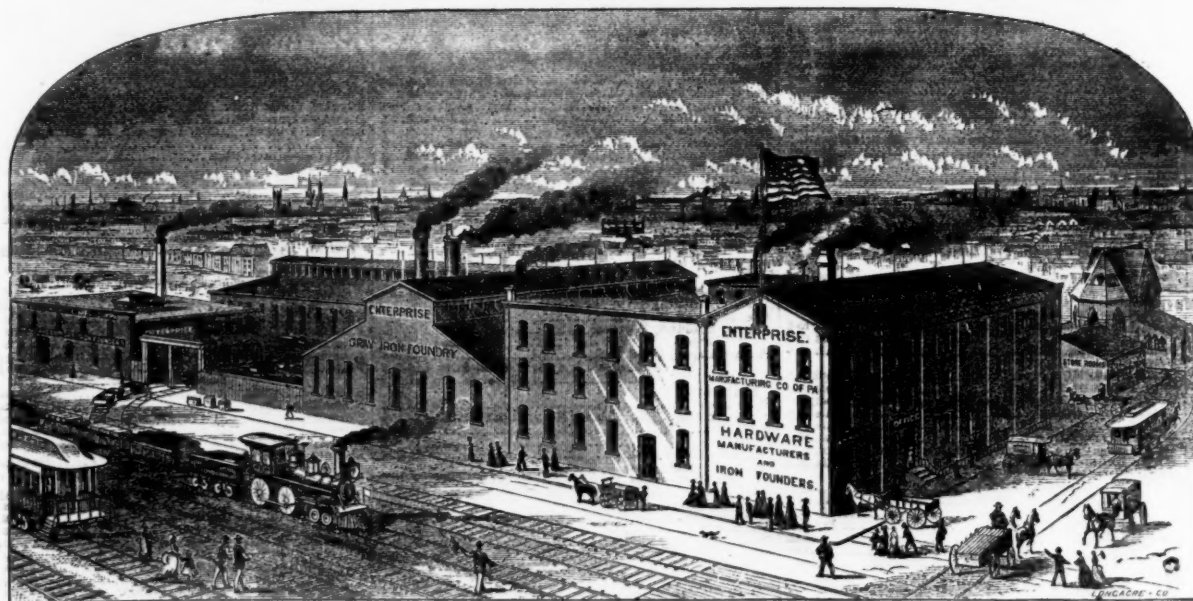
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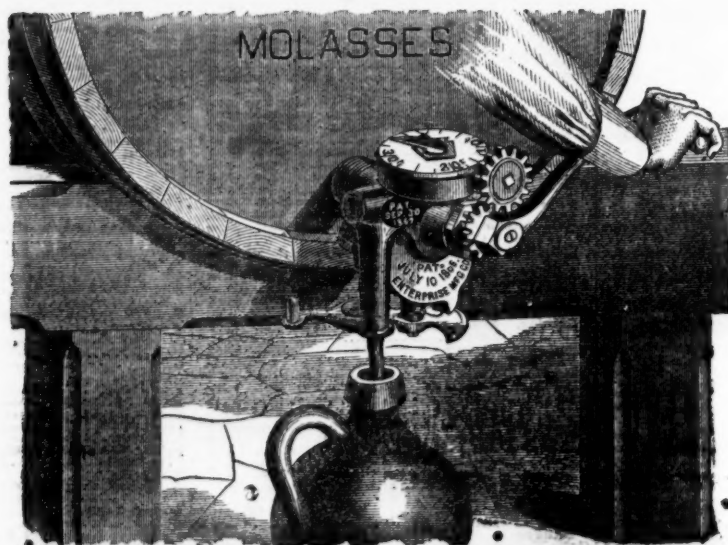
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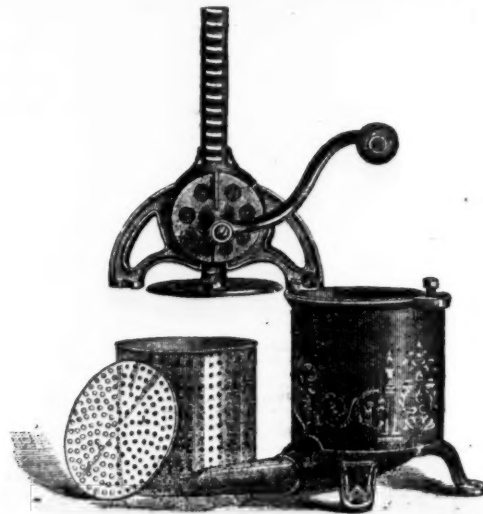
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No. 88 @ 210, dis 10 to 15	
No. 90 @ 215, dis 10 to 15	
No. 92 @ 220, dis 10 to 15	
No. 94 @ 225, dis 10 to 15	
No. 96 @ 230, dis 10 to 15	
No. 98 @ 235, dis 10 to 15	
No. 100 @ 240, dis 10 to 15	
No. 102 @ 245, dis 10 to 15	
No. 104 @ 250, dis 10 to 15	
No. 106 @ 255, dis 10 to 15	
No. 108 @ 260, dis 10 to 15	
No. 110 @ 265, dis 10 to 15	
No. 112 @ 270, dis 10 to 15	
No. 114 @ 275, dis 10 to 15	
No. 116 @ 280, dis 10 to 15	
No. 118 @ 285, dis 10 to 15	
No. 120 @ 290, dis 10 to 15	
No. 122 @ 295, dis 10 to 15	
No. 124 @ 300, dis 10 to 15	
No. 126 @ 305, dis 10 to 15	
No. 128 @ 310, dis 10 to 15	
No. 130 @ 315, dis 10 to 15	
No. 132 @ 320, dis 10 to 15	
No. 134 @ 325, dis 10 to 15	
No. 136 @ 330, dis 10 to 15	
No. 138 @ 335, dis 10 to 15	
No. 140 @ 340, dis 10 to 15	
No. 142 @ 345, dis 10 to 15	
No. 144 @ 350, dis 10 to 15	
No. 146 @ 355, dis 10 to 15	
No. 148 @ 360, dis 10 to 15	
No. 150 @ 365, dis 10 to 15	
No. 152 @ 370, dis 10 to 15	
No. 154 @ 375, dis 10 to 15	
No. 156 @ 380, dis 10 to 15	
No. 158 @ 385, dis 10 to 15	
No. 160 @ 390, dis 10 to 15	
No. 162 @ 395, dis 10 to 15	
No. 164 @ 400, dis 10 to 15	
No. 166 @ 405, dis 10 to 15	
No. 168 @ 410, dis 10 to 15	
No. 170 @ 415, dis 10 to 15	
No. 172 @ 420, dis 10 to 15	
No. 174 @ 425, dis 10 to 15	
No. 176 @ 430, dis 10 to 15	
No. 178 @ 435, dis 10 to 15	
No. 180 @ 440, dis 10 to 15	
No. 182 @ 445, dis 10 to 15	
No. 184 @ 450, dis 10 to 15	
No. 186 @ 455, dis 10 to 15	
No. 188 @ 460, dis 10 to 15	
No. 190 @ 465, dis 10 to 15	
No. 192 @ 470, dis 10 to 15	
No. 194 @ 475, dis 10 to 15	
No. 196 @ 480, dis 10 to 15	
No. 198 @ 485, dis 10 to 15	
No. 200 @ 490, dis 10 to 15	
No. 202 @ 495, dis 10 to 15	
No. 204 @ 500, dis 10 to 15	
No. 206 @ 505, dis 10 to 15	
No. 208 @ 510, dis 10 to 15	
No. 210 @ 515, dis 10 to 15	
No. 212 @ 520, dis 10 to 15	
No. 214 @ 525, dis 10 to 15	
No. 216 @ 530, dis 10 to 15	
No. 218 @ 535, dis 10 to 15	
No. 220 @ 540, dis 10 to 15	
No. 222 @ 545, dis 10 to 15	
No. 224 @ 550, dis 10 to 15	
No. 226 @ 555, dis 10 to 15	
No. 228 @ 560, dis 10 to 15	
No. 230 @ 565, dis 10 to 15	
No. 232 @ 570, dis 10 to 15	
No. 234 @ 575, dis 10 to 15	
No. 236 @ 580, dis 10 to 15	
No. 238 @ 585, dis 10 to 15	
No. 240 @ 590, dis 10 to 15	
No. 242 @ 595, dis 10 to 15	
No. 244 @ 600, dis 10 to 15	
No. 246 @ 605, dis 10 to 15	
No. 248 @ 610, dis 10 to 15	
No. 250 @ 615, dis 10 to 15	
No. 252 @ 620, dis 10 to 15	
No. 254 @ 625, dis 10 to 15	
No. 256 @ 630, dis 10 to 15	
No. 258 @ 635, dis 10 to 15	
No. 260 @ 640, dis 10 to 15	
No. 262 @ 645, dis 10 to 15	
No. 264 @ 650, dis 10 to 15	
No. 266 @ 655, dis 10 to 15	
No. 268 @ 660, dis 10 to 15	
No. 270 @ 665, dis 10 to 15	
No. 272 @ 670, dis 10 to 15	
No. 274 @ 675, dis 10 to 15	
No. 276 @ 680, dis 10 to 15	
No. 278 @ 685, dis 10 to 15	
No. 280 @ 690, dis 10 to 15	
No. 282 @ 695, dis 10 to 15	
No. 284 @ 700, dis 10 to 15	
No. 286 @ 705, dis 10 to 15	
No. 288 @ 710, dis 10 to 15	
No. 290 @ 715, dis 10 to 15	
No. 292 @ 720, dis 10 to 15	
No. 294 @ 725, dis 10 to 15	
No. 296 @ 730, dis 10 to 15	
No. 298 @ 735, dis 10 to 15	
No. 300 @ 740, dis 10 to 15	
No. 302 @ 745, dis 10 to 15	
No. 304 @ 750, dis 10 to 15	
No. 306 @ 755, dis 10 to 15	
No. 308 @ 760, dis 10 to 15	
No. 310 @ 765, dis 10 to 15	
No. 312 @ 770, dis 10 to 15	
No. 314 @ 775, dis 10 to 15	
No. 316 @ 780, dis 10 to 15	
No. 318 @ 785, dis 10 to 15	
No. 320 @ 790, dis 10 to 15	
No. 322 @ 795, dis 10 to 15	
No. 324 @ 800, dis 10 to 15	
No. 326 @ 805, dis 10 to 15	
No. 328 @ 810, dis 10 to 15	
No. 330 @ 815, dis 10 to 15	
No. 332 @ 820, dis 10 to 15	
No. 334 @ 825, dis 10 to 15	
No. 336 @ 830, dis 10 to 15	
No. 338 @ 835, dis 10 to 15	
No. 340 @ 840, dis 10 to 15	
No. 342 @ 845, dis 10 to 15	
No. 344 @ 850, dis 10 to 15	
No. 346 @ 855, dis 10 to 15	
No. 348 @ 860, dis 10 to 15	
No. 350 @ 865, dis 10 to 15	
No. 352 @ 870, dis 10 to 15	
No. 354 @ 875, dis 10 to 15	
No. 356 @ 880, dis 10 to 15	
No. 358 @ 885, dis 10 to 15	
No. 360 @ 890, dis 10 to 15	
No. 362 @ 895, dis 10 to 15	
No. 364 @ 900, dis 10 to 15	
No. 366 @ 905, dis 10 to 15	
No. 368 @ 910, dis 10 to 15	
No. 370 @ 915, dis 10 to 15	
No. 372 @ 920, dis 10 to 15	
No. 374 @ 925, dis 10 to 15	
No. 376 @ 930, dis 10 to 15	
No. 378 @ 935, dis 10 to 15	
No. 380 @ 9	



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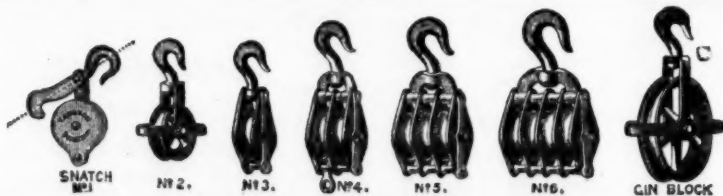
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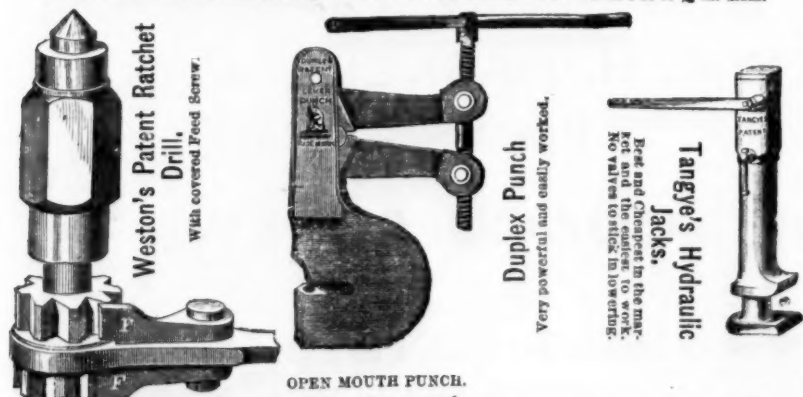
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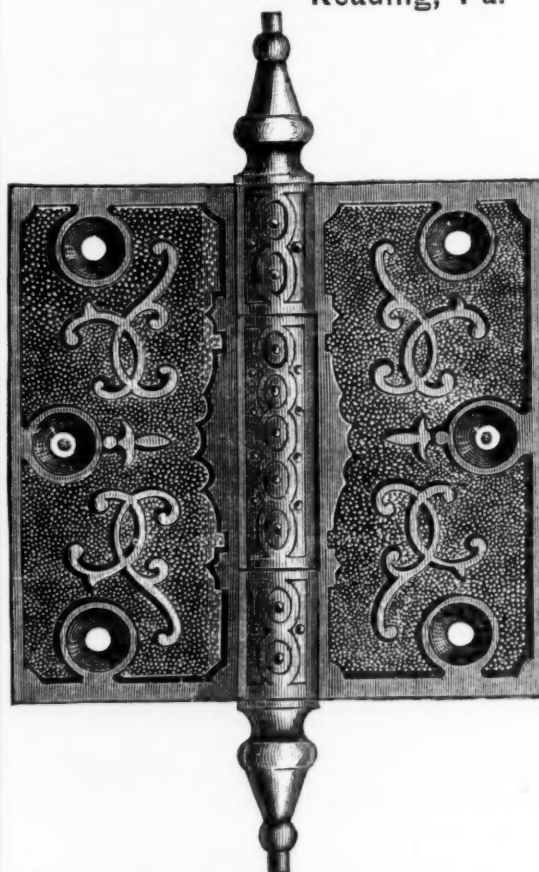
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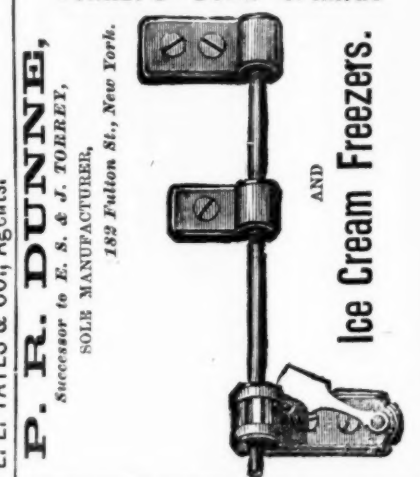
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St. and Newark Ave., Jersey City; Room 5, 111 Broad

way, N. Y. General Office, Bank Building, cor. Newark

and Hudson Sts., Hoboken. P. O. Box 247, Hoboken.



**WHEELING HINGE CO.,**

Wheeling, West Va.,

Manufacturers of

Wrought Butts, Strap & T Hinges, Wrought Hooks,  
Hasps & Staples, Wrought Repair  
Links & Washers.

GRAHAM &amp; HAINES, Sole Agents, 113 Chambers &amp; 95 Reade Sts., N. Y.

**QUACKENBUSH, TOWNSEND & CO.,  
Hardware, Cutlery, &c.**

85 Chambers &amp; 67 Reade Sts., N. Y.

Depot for  
OS JOWITT & SONS,  
(Sheffield, England.)  
LTS and HORSE RASPS,  
Rough & Ready  
And  
CLIPPER SCYTHES,  
Warranted.



Manufacturers of the

**CHALLENGE  
DOOR & GATE SPRING.**  
PATENTED  
JULY 11, 1871.

Agents for

Norwich Lock  
MFG. CO.

"BEAVER"  
(American)  
FILES and HORSE RASPS.  
"WIDE AWAKE"  
AXES.

Patented March 4, 1873.

**"FELTER'S PATENT LOCKS,"**

MANUFACTURED BY

**The American Lock Mfg. Co.,**

Are the most SECURE and DURABLE ever made.

SECURE

Because they have 40 Brass Tumblers, independent in their action, either one of which will prevent the lock from being opened unless brought to proper position by the Key.

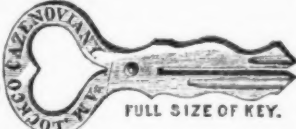
DURABLE

Because we use no Springs to break or get out of place.

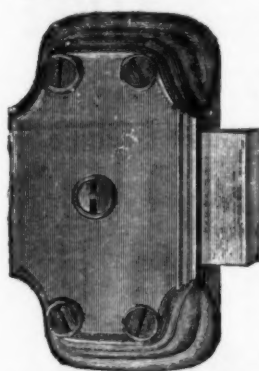
THEY HAVE

**STERLING METAL KEYS**

That will not corrode or wear, and are stronger than steel.



FULL SIZE OF KEY.



Upright Rim Dead Locks,  
Horizontal Rim Night Latches,  
Horizontal Rim Tubular Night Latches,  
Mortise Night Latches, Plain Fronts,  
Mortise Night Latches, Ornamental Bronze  
Fronts and Knobs,  
Brass Chest, Box, Cupboard and  
Drawer Locks,

Solid Bronze Padlocks.

Illustrated Catalogue and  
Price List sent on application.All orders should be addressed  
to

UNION NUT CO., General Agents, 99 Chambers St., N. Y.

**BALDWIN'S**

Celebrated

**CAST STEEL**

FOR

Tools, Dies, Drills, &amp;c.,

Or any Other Purpose where Excellence of Quality is Desired.

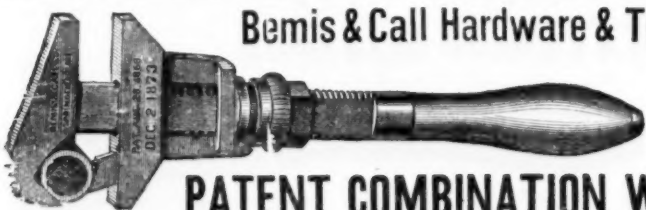
Unequaled by any other American and Unexcelled  
by any Foreign Steel.**12½c. per Pound,**

Less 1-2c per Pound for Ton Lots, Net Cash.

**NEWLIN & YARDLEY,**

Agents,

PHILADELPHIA.



Bemis &amp; Call Hardware &amp; Tool Co.

**PATENT COMBINATION WRENCH.**

These Wrenches are made from the best of Wrought Iron, with Steel Head and Jaw, Case-hardened throughout, and not only combine all of the superior qualities of our cylinder or Gas Pipe Wrenches, but also all requisite combinations of a regular Nut Wrench, thus making a Combination which has no equal.

For Circulars and Price List, address,

BEMIS &amp; CALL HARDWARE &amp; TOOL CO. Springfield, Mass.

Established in 1839.

A. G. COES &amp; CO.

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Manufacturers of

THE GENUINE

COES'

**SCREW WRENCHES.**

Our goods have been very much improved recently, by making the Bar WRENCH, as shown in the cut, which makes a 12 in. Wrench as strong as a 15 in. made in the ordinary way, and by using

A. G. COES'

NEW PATENT

**FERRULE**

Which cannot be forced back into the handle.

Our goods are manufactured under Patents dated February 7, 1860, (re-issued June 23, 1871), May 2, 1871, and Dec. 26, 1871, and any violation of either will be vigorously prosecuted.

We call particular attention to our new Patent Ferrule, with its supporting Nut (shown in section in the above cut), which makes the strongest Ferrule fastening known.

A. G. COES &amp; CO.

Our Agents, GRAHAM & HAINES, 113 Chambers St. New York, carry a full line of our goods, and will be pleased to serve you at factory prices.

GRANT & CO., Newark, N. J.  
**Cap Rifles & Targets.**

N. Y. MALLET and HANDLE WORKS



Manufacturers of

Calkers', Carpenters', Stone Cutters',  
Tin, Copper and Boiler Makers'**MALLETS,**

Hawling Beets, Hawling and Calking Irons  
also all kinds of Handles, Sledge, Chisel and Hammer  
Handles. Also

COTTON AND BALE HOOKS,  
Patented Feb. 13, 1877; a new combination of Hooks.  
456 E. Houston St., New York City.

W. &amp; J. TIEBOUT,

MANUFACTURERS OF

Brass, Galvanized and Ship Chandlery

**HARDWARE.**

390 Pearl Street, NEW YORK.

WILSON BOHANNAN,

Manufacturer of Patent

**BRASS  
Pad Locks,**

FOR

Railroad Switches,  
Freight Cars,

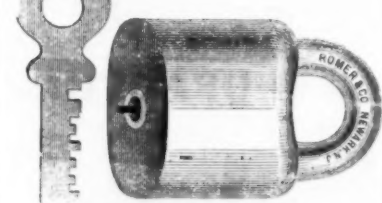
AND THE HARDWARE TRADE

All sizes, with Brass and Steel  
Keys, with and without chains.**PASSENGER CAR LOCKS,**

Bronzed, Nickel-Plated and Japanned.

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Illustrated Catalogue sent upon application.



ROMER &amp; CO.,

Established 1837. Manufacturers of Patent Scandinavian  
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Switches. Also, Patent Stationary R. R. Car Door  
Locks. Patent Piano and Sewing Machine Locks.  
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Manufacturers of Copper, Brass, and Iron Rivets: Com-  
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Tacks: Finishing, Hungarian, Trunk, Closet and Cush  
Box Nails, &c. Rivets made to Order.

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165 Greenwich Street,

Agent for the Philadelphia Star Carriage and Tire Bolts.

**Lloyd, Supplee & Walton,  
HARDWARE FACTORS.**

MANUFACTURERS OF

**Bonney's Hollow  
AUGERS.**Stearn's Hollow Augers  
and Saw Vises

Bonney's Spoke Trimmers

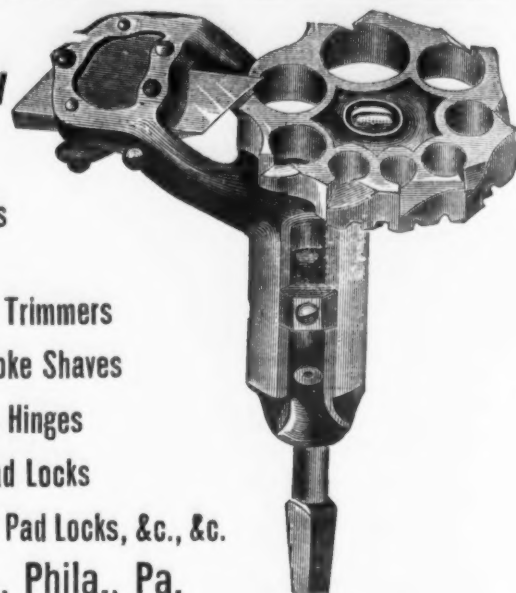
Double Edge Spoke Shaves

Adjustable Gate Hinges

Scandinavian Pad Locks

Flat Key Brass and Iron Pad Locks, &amp;c., &amp;c.

625 Market St., Phila., Pa.



CHAMPION

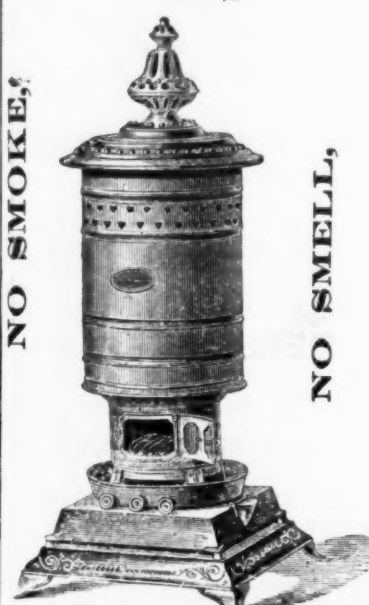
**Oil Heating Stove.**

No. 3½.

CENTENNIAL

**Gas Heating Stove.**

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The Cheapest and Best Oil and Gas Heating Stoves in the World.

MANUFACTURED BY

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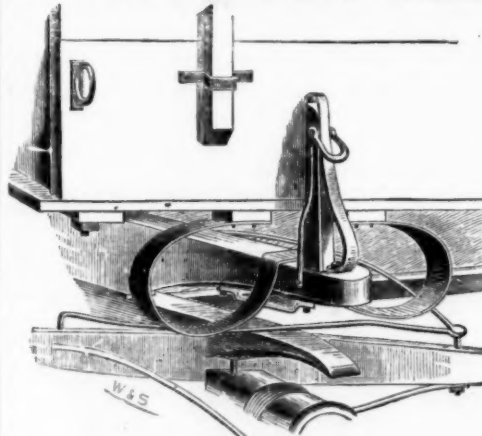
Nos. 240 &amp; 242 Pearl Street, New York

SOMETHING NEW.

**BOLSTER SPRINGS**

For Farm and Lumber Wagons.

Pulliam's Patent.



Made of the best steel, and war-  
ranted. Will fit wagons of any size.  
Are attached by four bolts through  
the bottom of the bed. Lift off the  
gear with the bed. Designed to re-  
main on the wagon for all kinds of  
work. Operates equally well whether  
on a loaded or empty wagon. Saves  
largely in wear and tear. Removes  
necessity of spring seat. Affords  
comfortable riding for from one per-  
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Price, per set of four springs, \$6.50.  
Liberal margin to Wagon Manufac-  
turers and Dealers. Correspondence  
solicited, and circulars furnished

**Semple & Birge Mfg. Co.**

ST. LOUIS.

Parkhurst &amp; Wilkinson,

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**WM. H. HASKELL & CO.,**

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MANUFACTURERS OF

**COACH SCREWS**

(With Gimlet Points),

ALL KINDS OF

Machine and Plow Bolts,

FORCED SET SCREWS,

AND

TAP BOLTS.









**E. M. BOYNTON,**

Manufacturer of all kinds of  
First-Class Saws, Saw Frames, Cross-Cut Handles, Tools, Files, &c. Also Sole  
Proprietor and Manufacturer of the Genuine Patent Lightning Saw.  
80 BECKMAN STREET, NEW YORK.

**TRIAL OF THE IMPROVED LIGHTNING SAW.**

The Emperor, Dom Pedro, accompanied by Director General Goshorn, Superintendent Albert, and others, visited Machinery Hall, at the Centennial on the evening of June 28th. Among other things inspected, at the invitation of E. M. BOYNTON, of New York, they witnessed a trial of the *New Lightning Saw*, patented March 26, 1876. Two men, with one of these saws, cut off a sound log of gum-wood, one foot extreme diameter, in seven seconds, or at the rate of a cord of wood in five minutes. Messrs. Corliss, Morell, Lynch, and other members of the commission, witnessed the trial and timed the cutting. The Emperor remarked, That was fast, very fast cutting. Last evening the Emperor made another examination of the saw.—*Philadelphia Press*, June 30.

"BOYNTON'S SAWS were effectually tested before the judges at the Philadelphia Fair, July 6th and 7th. An ash log, eleven inches in diameter, was sawed off, with a four-and-a-half-foot lightning cross-cut, by two men, in precisely six seconds as timed by the chair man of the Centennial Judges of Class Fifteen. The speed is unprecedented, and would cut a cord of wood in four minutes. The representatives of Russia, Austria, France, Italy, Spain, Belgium, Sweden, England, and several other countries, were present, and expressed their high appreciation."

Received Medal and Highest Award of Centennial World's Fair, 1876.  
\$1000 Challenge was prominently displayed for six months, and the numerous saw manufacturers of the world dared not accept it, or test in a competition so hopeless.

## Wheeler, Madden & Clemson

### MFG. CO.,

MIDDLETOWN, - - - NEW YORK.

Manufacturers of  
**WARRANTED CAST STEEL**

**SAWS**

Of every description, including  
Circular, Shingle, Cross-Cut, Mill, Hand,  
**WOOD SAWS, Etc., Etc.**

**Harvey W. Peace, Vulcan Saw Works.**

Manufacturer of every kind of

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**SAWS.**



Circulars, Cross-Cuts, Mill  
Mule, Gang, Hand,  
and Butcher.  
Molding and Planing Knives.  
Plastering Trowels, Miter-  
ing Rods, &c.

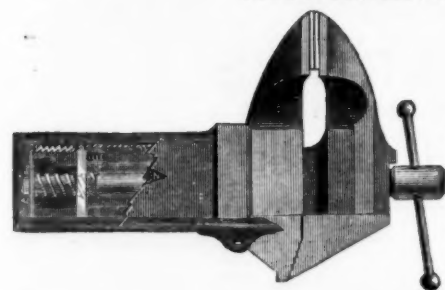
Union Avenue, Tenth and Alameda Streets, BROOKLYN, E. D., N. Y.

**AMERICAN SAW CO.,**

Manufacturers of  
Movable Toothed Circular Saws,  
**PERFORATED CROSS-CUT SAWS**  
And SOLID SAWS of all kinds. Trenton N. J.

**"TRENTON" RAPID TRANSIT VISES.**

Pat. Nov. 1st, 1870; Feb. 12th, 1877.



**PARALLEL  
Swivel and Coachmakers'  
VISES.**

The Best Rapid Adjustable Vise in  
the Market.

Simple and durable. No chance of  
getting out of order. No toggle or cam  
movements or parts. A trial will con-  
vince.

MANUFACTURED BY THE  
**TRENTON VISE & TOOL WORKS, Trenton, N. J.**

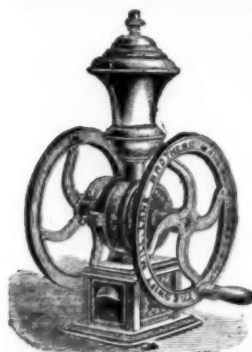
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**HERMANN BOKER & CO., Proprietors,**  
101 & 103 Duane Street, NEW YORK.

**THORNE, DeHAVEN & CO., Drilling Machines,**

21st Street, above Market, Philadelphia.

PORTABLE DRILLS. Driven by power in any direction.  
RADIAL DRILLS. Self-feed—Large Adjustable Box Table.  
VERTICAL DRILLS. Self-feed.  
MULTIPLE DRILLS. 2 to 30 Spindles.  
HORIZONTAL BORING AND DRILLING MACHINES.  
HAND DRILLS. CAR BOX DRILLS.  
SPECIAL DRILLS. For Special Work.

**THE SWIFT MILL.**

ESTABLISHED 1845.

The annexed cut shows one of the many styles of Coffee Mills of  
our manufacture, especially adapted to Grocers' use and all retailers  
of coffee. They are highly ornamental, and workmanship of the very  
best. We make more than 30 styles.

ALSO LANE'S PORTABLE COFFEE ROASTER

Will roast 30 to 40 lbs. at once, and can be used as a stove at other  
times. Send for descriptive list to Manufacturers.

**LANE BROS., Millbrook, N. Y.**

Also sold by leading wholesale houses.

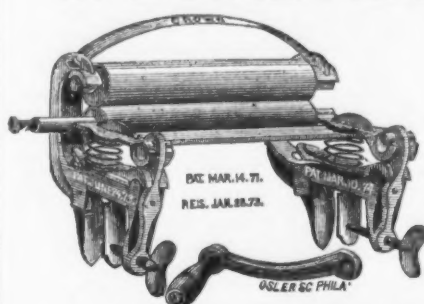
Our agents, Graham & Haines, 123 Chambers St., New York,  
carry a full line of our goods, and will be pleased to serve you at Fac-  
tory prices.

**L. M. RUMSEY & CO.**  
MANUFACTURERS & JOBBERS OF  
**PUMPS & FIRE ENGINES,**  
LEADPIPE  
SHEET-LEAD  
RAILWAY SUPPLIES,  
PLUMBERS & STEAM FITTERS,  
BRASS GOODS,  
NO. 811, N. MAIN STREET,  
ST. LOUIS, MO.  
GASPIPE  
FITTINGS  
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Witherell's Patent  
RUBBER  
BUCKET  
PAT. OCT. 13. 68.  
REISS. JUNE 12. 77.  
FOR  
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L. M. Rumsey & Co.,  
ST. LOUIS.

**THE AMERICAN MACHINE COMPANY, Philadelphia, Pa.**

MANUFACTURERS OF

**SPECIALTIES OF LIGHT IRON WORK.**

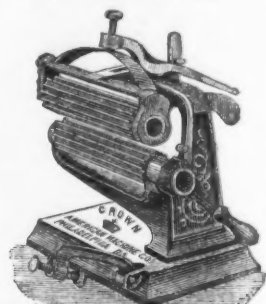
**CROWN WRINGERS,**

with Patent White Rubber Rolls, Galvanized Malleable Iron Frame Work,  
Bessemer Steel Springs, &c. Noted for Strength, Durability, Efficiency and  
Simplicity.  
No. 2, Rolls 1 1/2 in. diam., 10 in. long. No. 3, Rolls 1 1/2 in. diam., 12 in. long.  
No. 4, Rolls 2 in. diam., 12 in. long.



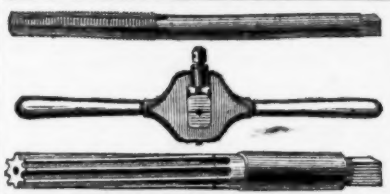
**CROWN FLUTING MACHINES,**

with valuable improvements over other style Machines, Patent Spring Ar-  
rangement and Clamping Device. Noted for Superiority of Finish and Prac-  
tical Advantages. The leading Machine in the market.  
Sizes (Length of Rolls) 4 1/2 inch, 6 inch and 8 inch.  
Rolls with 12, 15, 18, 22, 26 and 30 flutes.

**THE "VICTOR" CHUCK.**

Price, \$8 50.

Holds from 0 to 3/4, and will carry 3/4 by  
reducing the shank, as represented.  
The accompanying cuts represent an im-  
proved Drill Chuck, which embodies new  
and essential features that have long been  
sought after by manufacturers, mechanics,  
and others requiring a first-class Chuck.  
It is the only adjustable Drill Chuck, and  
is more simple, practical and effective than  
any in the market. The Chuck is self-tight-  
ening, and the grasping power of the  
clutches is much greater than in other  
chucks. The clutches being flush with the face or front of the Chuck, the workman  
has less difficulty in adjusting the drill, and greater durability is assured as they  
are not liable to be broken by any strain or twist, or by dropping the chuck. The  
levers are enlarged and rounded at their fulcrums, forming spherical bearings  
which rest against adjustable set-screws, producing a sure and easy adjustment  
of the drill of the work. The Chuck is steel throughout and of the finest me-  
chanism. Address: THE VICTOR SEWING MACHINE CO., Middletown, Conn.

**H. PRENTISS & CO.,**

Sole Manufacturers of

**GODDARD'S PATENT-RELIEVED  
Machinists' and Gas Fitters'  
TAPS,**

AND SOLID REAMERS,

**Machinists' Supplies.**

**E. A. GODDARD,**

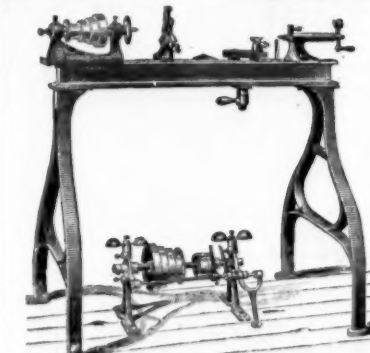
Late N. Y. Tap & Die Co.,  
General Sales Agent, 14 Dey Street, New York.  
Send for Price List.

**Patent Portable Hoisting Machines**

PRICE LIST.

To Lift.	To Raise.	Price.	Ex. Ft.
8 ft.	500 lb.	\$22 50	\$1 00
8	1,000	24 00	1 50
8	2,000	30 00	1 50
8	3,000	40 00	1 75
9	4,000	60 00	2 00
10	6,000	75 00	2 20
10	8,000	95 00	2 40
12	12,000	150 00	3 75
12	16,000	225 00	4 75
12	20,000	300 00	6 00

**EDWIN HARRINGTON & SON.**  
Also Manufacturers of Machin-  
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15th St. and Pennsylvania Ave.  
PHILADELPHIA.

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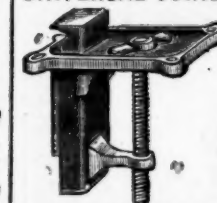
TOOL & MACHINE WORKS,

Manufacturers of Engine, Brass Finishers', Wood Turn-  
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Slide Rest, Screw Machines, Turret Heads, Screw  
Presses, Screw Clamps, Lathe Carriers, &c.  
440 N. 12th St., above Noble, Philadelphia, Pa.  
Israel H. Johnson, Jr. Joshua A. Johnson, Jr.

**ERNST PASSE, PRACTICAL MACHINIST.**

Inventor and Manufacturer of the

**UNIVERSAL JOINERS for Steam and Foot Power.**

**Patent Grindstone Frame.**

This is the greatest invention of its kind  
in the market. Can be worked from either  
right or left side. I sell to dealers the  
treadle and shafting only, or fancy frames  
with treadle and shafting complete with-  
out stone.

I also call attention to my Patent Perfect  
**BENCH STOP.**

This stop is stronger than any in the  
market, and is a perfect stop.

WORKS: COR. SECOND & CENTRAL AVENUES, CINCINNATI, O.

**H. S. MANNING & CO.,**

Sole Sales Agents for THE MORSE TWIST DRILL AND MACHINE CO.'S

Manufacture of Patent Machine Relieved Nut, Hand, Black-  
smith and Machine Screw Taps, Screw Plates, Tap Wrenches  
and Patent Relieved Pipe Taps and Pipe Ream-  
ers, also of Solid Bore and Pipe Dies. Furnished  
either in V or U. S. Standard shape of threads.

**111 Liberty Street, NEW YORK.**

## GOLD MEDAL Non-Extensible Razor Belt.

PATENTED JULY 25, 1871.

RE-ISSUED MAY 13, 1873, and JUNE 9, 1874.

In this Strap the liability of the leather to stretch and become loose and porous is prevented by the  
use of a patented non-extensible base, which supports the leather and secures

**PERMANENT ELASTICITY.**

We make this style with single rod, double rod, and wood frames, and intend that it shall, in quality  
compare favorably with our other well known brands.

**BENJAMIN F. BADGER & SON, Manufacturers,**  
Badger Place, Charlestown, Mass.

**Ludlow Valve Mfg. Co.,**

OFFICE AND WORKS:

938 to 954 River St. & 67 to 83 Vall Ave., Troy, N. Y.,

**VALVES**

(Double and Single Gate, 1/2 in. to 48 in.—outside and inside Screws, Indicator, &c.  
for Gas, Water and Steam. Send for Circular.

**Also FIRE HYDRANTS,**







## THE JUDSON GOVERNOR.

It is a common method to advertise Governors without cost, unless satisfactory to the customer, and then charge High Prices for doing what any good Governor will do. Various Governors in use to the "Judson" are sold in this way, operating well enough for three months, to insure collection of the pay, but becoming useless after a year's wear—their construction lacking durability. The Judson Governor is guaranteed to be not only the best Regulator of Steam Engines, but also the most durable Governor made. Parties in buying other Governors should stipulate that their durability be guaranteed, and should also take care that they do not for much inferior Governors, pay higher prices than those shown in the accompanying list. We guarantee the Judson Governor will do all any other Governor can do, and in Accuracy and Durability—the main essentials—we guarantee it shall do more.

## Reduced Price List, FEBRUARY 1, 1877.

For dimensions of Governor, see Illustrated Price List.

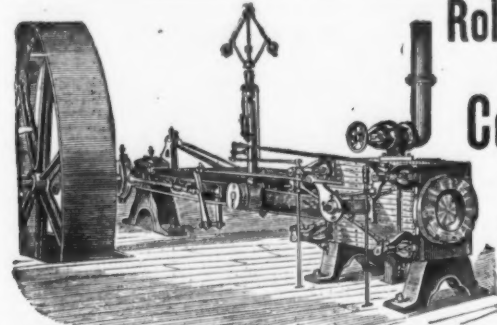


THE JUDSON PATENT Improved Steam Governor.

Size, Inch.	Plain.	Bright Finish.	Extra.	Speed.	Stop Valve.
1	\$16.00	\$18.00	\$1.00	..	..
1 1/4	20.00	22.00	2.00	85.00	..
1 1/2	23.00	26.00	2.25	6.00	..
1 3/4	26.00	30.00	2.50	8.00	..
2	31.00	35.00	2.75	10.00	..
2 1/4	36.00	41.00	3.25	12.00	..
2 1/2	40.00	45.00	3.50	14.00	..
2 3/4	45.00	51.00	3.75	16.00	..
3	50.00	57.00	4.25	19.00	..
3 1/4	59.00	67.00	4.50	23.00	..
3 1/2	69.00	78.00	5.00	28.00	..
3 3/4	80.00	90.00	5.50	34.00	..
4	90.00	101.00	6.00	40.00	..
4 1/4	105.00	117.00	6.50	46.00	..
4 1/2	120.00	133.00	7.00	54.00	..
4 3/4	142.00	158.00	8.00	65.00	..
5	175.00	192.00	9.00	79.00	..
5 1/4	198.00	218.00	10.00	..	..
5 1/2	210.00	240.00	12.00	..	..

No Charge for Boxings & Carriage.

JUNIUS JUDSON & SON, Rochester, N. Y.



Robt. Wetherill & Co  
CHESTER, PA.

Corliss Engine

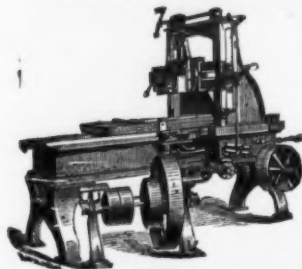
BUILDERS,

Shafting & Gearing.  
Boiler Makers.

The Pratt & Whitney Co.,  
Hartford, Conn.,

Have constantly on hand and making

Drop Hammers

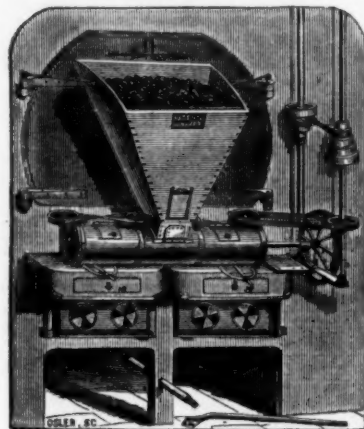


Of recently Improved Construction. Pony Trip Hammers, Blacksmiths' Sheaves, Broaching and Stamping Presses, Iron Shop Cranes, Machinists' Tools, Gun and Sewing Machine Machinery. Make to order Gray and Charcoal Iron Castings of all styles and sizes not exceeding 15 tons weight, (making patterns if desired). Furnish Clamp Pulleys of light patterns, cut gears in a superior manner, &c., &c.

The United States Automatic Stoker Co.

Is now prepared to erect

AUTOMATIC STOKERS



(as shown in the British Section of the Centennial Exhibition, and for which patents have been granted in the United States and Great Britain, to DILLWYN SMITH), on favorable terms to manufacturers and all others using steam power. For prices, descriptive circulars, etc., address

The United States Automatic Stoker Co.,  
No. 3 Chestnut St., Philadelphia, Pa.

An increase of steam of from 20 to 30 per cent. from a given grate surface, is the almost invariable result of the use of these stokers, and this is obtained from the use of the smallest sorts of coal in place of the larger sorts applied by hand firing. Over 100 machines in use abroad. The following is selected from many recommendations:

From A. M. Collins, Son & Co's Factory, 3d and Canal Sts., Philadelphia.

DILLWYN SMITH, Esq.—Dear Sir: After several months' experience with your Automatic Stokers, we take pleasure in stating that they have proved entirely satisfactory to us. The saving in cost of fuel is estimated at 20 per cent., increased amount of steam fully 30 per cent., besides giving us a very regular supply, the variation not being appreciable on steam gauge. Hoping you may be successful in introducing them into general use in this country, we remain, Yours, truly,  
A. M. COLLINS, SON & CO

HAMMER & CO.,

Branford, Conn.,

Manufacturers of the following Patented Articles of

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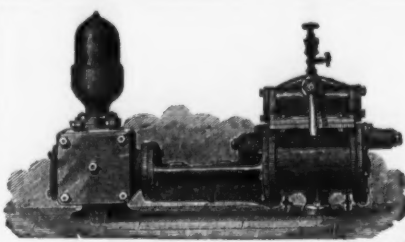
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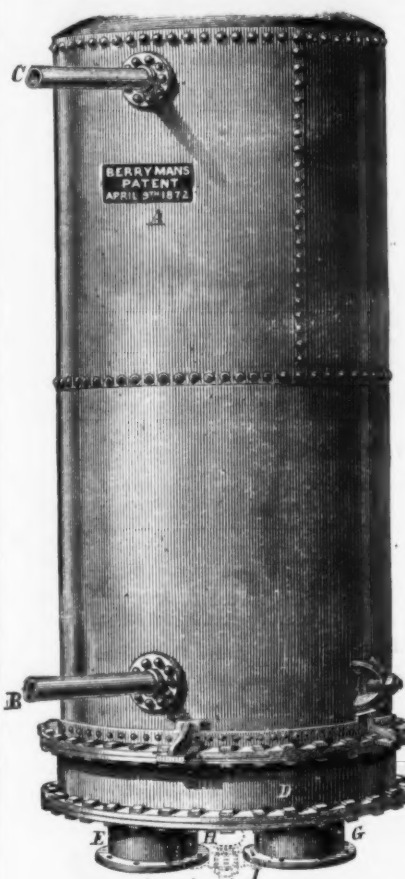


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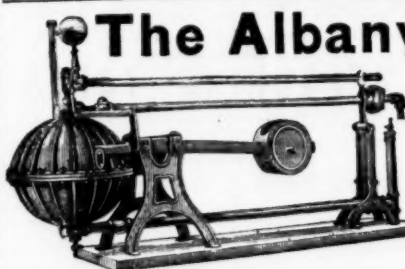
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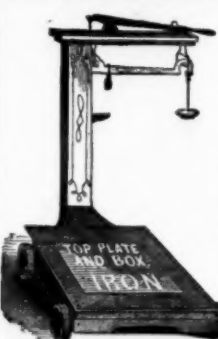
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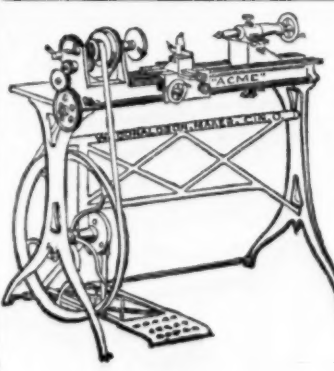
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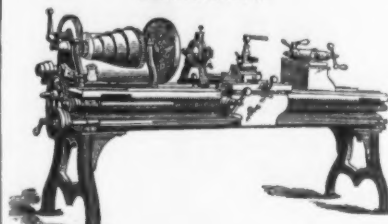
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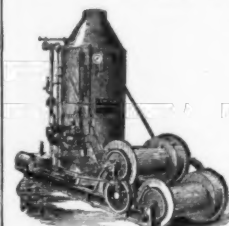
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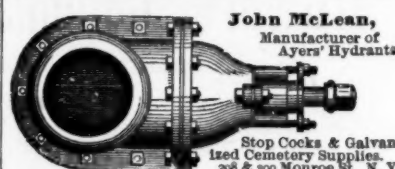
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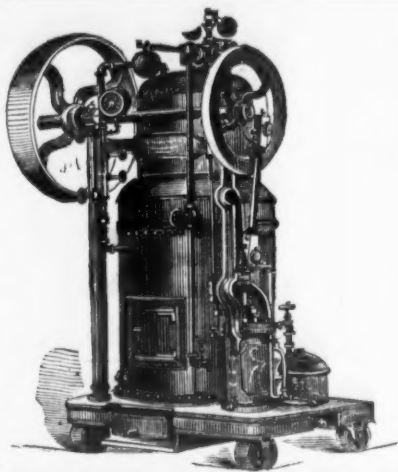
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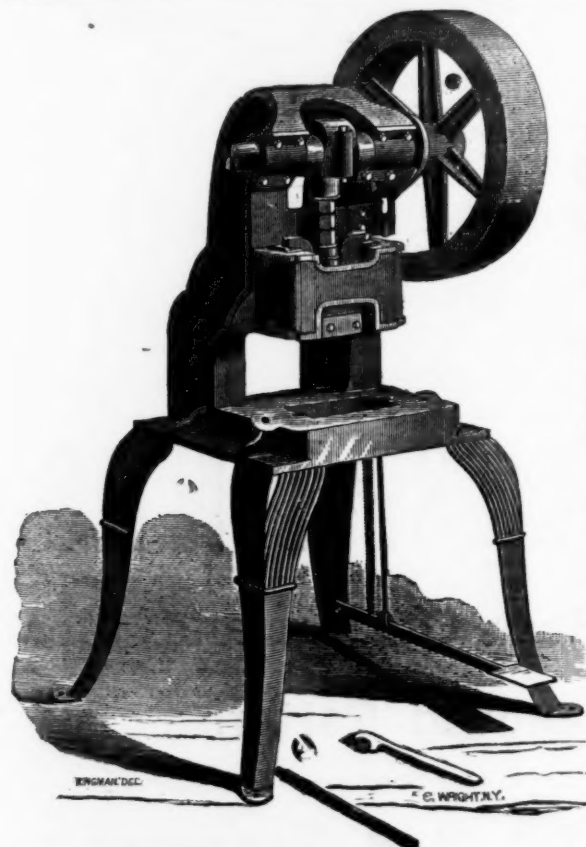
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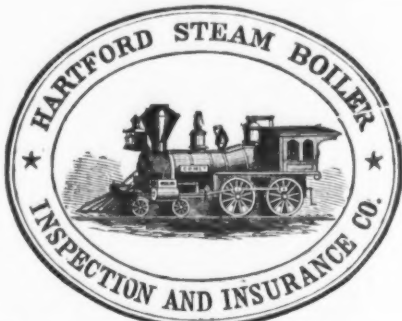
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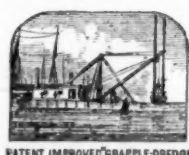
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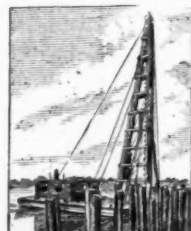
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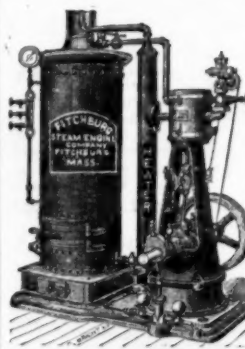
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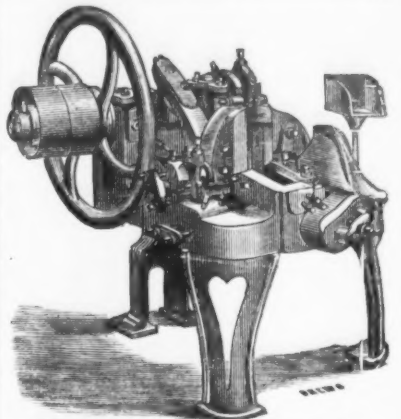
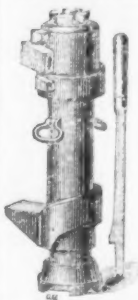
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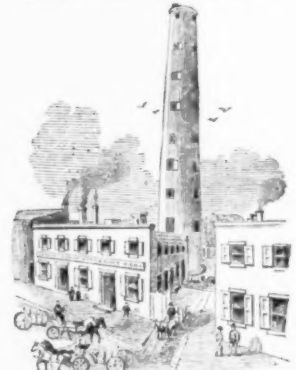
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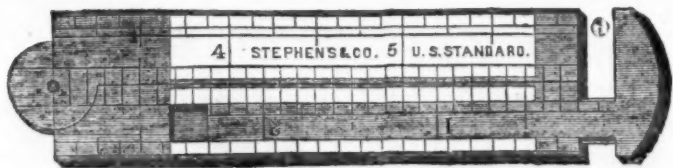


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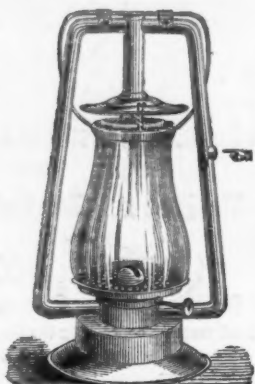
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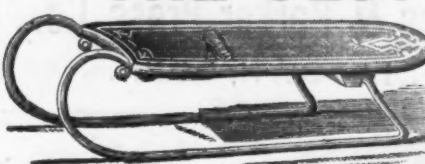
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